40 Rose ©

POPULAR Computing WEEKLY

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16-22 August 1984

It's the best selling weekly

Vol 3 No 33



Siel's new MK 900 MIDI keyboard

MIDI for micros

MIDI, the communications standard that has transformed the synthesiser and electronic music keyboard industry, is making its first inroad into the computer market.

The MIDI standard enables musical instruments to commu-

continued on page 5 ▶

Atari prices slashed

ATARI will, as predicted, dramatically cut the prices of all its machines software and peripherals from September 1.

The 600 XL computer will retail for £99.99 a drop of £80 from the current price and the 800 XL will fall by over £50 from £249.00 to £190.99

Software for both the VCS machines and computers will be reduced in price across the board to £9.99

Peripherals prices will also fall; the 1020 printer will come down to £99.99 from £149.99; the 1050 disc drive will come down to £199.99 from £299.99; and the 1027 letter quality printer will come down to £249.99 from £299.99.

Rob Harding, Atari's marketing manager said, "The new retail price list, we believe, reflects the true marketing prices for the products. It is by no means a 'flog-off' — we plan to continue marketing all Atari products."

The price cuts are a direct result of the company's takeover by former Commodore chief, Jack Tramiel: "With the new management there is a drive for Atari to become more competitive and aggressive in the UK."

Simon Westbrook, who has since the take-over been Atari Corporation UK's managing director, is now to continue in the post on a permanent basis. Previously Atari had announced that Commodore International executive David Harris would be joining Atari's UK branch as managing director.

First Star titles arrive

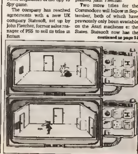
MORE American software will shortly be available, in the UK, this time from First Star of New York, originators of the *Spy vs Spy* game.

The company has reached agreements with a new UK company Statesoft, set up by John Fletcher, former sales manager of PSS to sell its titles in Britain.

"The first two releases are *Astro Chase* and *Flip and Flop*, both for Commodore 64" explained John Fletcher.

Two more titles for the Commodore will follow in September, both of which have previously only been available on the Atari machines in the States. Statesoft now has the

continued on page 5 ▶





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3D Motor Bike Grand Prix on the 48K Spectrum — £6.95



Popular Computing Weekly
Vol 3 No 33

)View

If there is a growing disenchantment with home computers — as one much publicised recent market research document has suggested — it is because the rapidly increasing sophistication of the machines themselves is not being matched by the software they run. The programs are strong on technical quality but very weak on original ideas.

Recreational software began as a new toy. *Space Invaders* was a novelty. Since then it has developed to produce the *Manic Miner* type of game. No longer a toy. Instead a puzzle — just like those infuriating tangles of metal hoops that every year fall out of crackers, asking to be solved. But such puzzles only hold one's interest for a while.

When will the micro equivalent of the book evolve? The closest so far are adventure games. Certainly any subject which can be treated in a book or a film can be put into an adventure. But what do we have? Any more elves, trolls, warrior princes and worst of all, princesses just waiting to be rescued, and I shall be throwing myself on to the nearest Sword of Darkness.

Where are software equivalents of the political satires? The biographies? The travelogues? The documentaries? The modern history books?

Where is the intelligence and subtlety? Where is the software that doesn't assume we are all gibbering trigger-happy idiots?

It's never been written because it's too much like hard work. It's much easier to just knock off another couple more *Miners*, *Atic Atacs*, or *Q-Berts*.

Software houses must savour their success while they can. Our collective intelligence is being insulted. And we are getting *bored*.

)Presents...

)Futures...

The Dragon takes on Spectrum-like characteristics with a program to enable Basic programming with single key presses ... how to down-load the QL's hi-res screen graphics on to a printer ... and Star Game is *Jaws* for the BBC.

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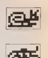
CTA Magazine of the Year 1984

Have you got what it takes to build your very own monster?

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BY COLIN STEWART



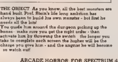








THE SETTING Professor F.N Stein's laboratory in his Castle in the Black Forest.
THE TIME 1884
THE GAME. 80 Screens requiring timing, logic and planning to complete
THE OPPOSITION Too many to list here but featuring: Snails bets, ice (it makes you slip), firemen's poles man eating pumpkins, spiders, slime (it slows you down), caterpillars, tanks springs, light bulbs (they electrocute you), mice, lobsters, snakes, bumble bees, jack-in-the-first etc.



THE OBJECT As you know, all the best monsters are hand built. Prof. Stein's life long ambition has always been to build his own monster - but first he needs all the bits!
You guide him around the dungeon picking up the bones - make sure you get the right order - then activate him by throwing the switch - the longer you take to complete each screen the higher will be the charge you give him - and the angnar he will become so watch out!





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Midi for home computers

◀ continued from page 1

nicate with each other, allowing for such things as one keyboard playing another or controlling a digital drum machine via, for example, a separate synthesiser

Now home computers will be able to be connected into a MIDI network. Italian keyboard specialists Siel has developed and interface that enables Commodore 64 and Spectrum micros to be connected to a MIDI keyboard.

The connection allows the computer's memory to be used to store notes and be used as a sequence — playing back sequences of notes and chords which can then be used as an accompaniment for live playing or for complete computer control of the keyboard.

The interface also enables information to be sent from the music keyboard to the computer allowing, for example, automatic notation as the keys are played — instantaneous score writing

Both the Commodore 64 and Spectrum MIDI interfaces will be priced at £99. A BBC version of the interface will be available by the end of August.

Siel is also launching a low-cost portable MIDI standard music keyboard to accompany the microcomputer interfaces. Called the MK900 it is aimed specifically at home micro owners and is expected to retail in £449 (about half the usual price of a compatible keyboard)

Software currently available for the Siel keyboard and interface includes sequencers and a multi-track composer program.

More details from Siel, Suffolk House, Massetts Road, Horley, Surrey

The Siel keyboard is just the first of a number of low-cost MIDI standard units. Casio for example, is expected to launch a 'cheap' MIDI keyboard later this year

Yamaha's DX 5 MSX computer is offered with a sophisticated sound synthesiser add-on and mini-keyboard which also adopts MIDI standard.

Discount software club

MAIL-ORDER booksellers, Book Club Associates, is to begin selling discount software through the post.

The company is setting up the Home Computer Club, which will offer computer books and software for three machines Spectrum, Commodore 64 and BBC

"The Home Computer Club will operate in much the same way as the Book Club does," said a Book Club spokesman. "Customers join by taking advantage of an introductory offer. They must specify which machine they are interested in, and from then, they will receive a Club catalogue every two months which deals exclusively with their machine."

Computer Club customers will have to buy at least one title every two months, from about fifteen products in each magazine. They will get a statutory 25 per cent discount on each purchase — sometimes more."

Titles included in the Home Computer Club's introductory offer, due to appear at the end of this month, are *The Hobbit* at £2.78 and *Hungry Horace*, at 75p, both from Melbourne House, and *White Knight MKII* at 75p from BBC Soft.

So far Book Club Associates has dealt almost exclusively with companies like Melbourne House which have a book publishing tradition. "Book publishers know that book clubs do not detract from sales at all," explained the spokesman.

Birds of Bourne

THE Royal Society for the Protection of Birds has teamed up with Bourne Educational Software to produce *Osprey!*, a game based on the struggle for survival of the endangered Scottish osprey population.

A 32-page booklet on the birds accompanies the program, which is the first of an educational/games series from BES called *Discovery*

Versions for the BBC, Electron and Amstrad will be available in September at £9.95. Commodore 64 and Spectrum versions are to follow.

Future of the Megagames

MEGAGAMES developed by Imagine Software are now in the hands of Imagine's liquidator.

When Imagine went into receivership, the ownership of the Megagames was in doubt. A contract between Imagine and Finchspeed, the company set up by three then Imagine directors, had been signed selling Finchspeed the copyright

However in law, any disposition of a company's assets taking place after a petition for winding up is presented can be set aside

The liquidators for Imagine, Arthur Young, McLelland Moores and Co., are currently holding talks with parties interested in acquiring the Megagames and continuing their development.

Since the Imagine collapse four former Imagine programmers have joined Software Projects. However Alan Maton, Software Projects' managing director said that Software Projects would not be working on any as Imagine games, nor was it interested in adding the Megagames to its catalogue

Most of Imagine's other programmers including its best known, Eugene Evans, are working with former directors Dare Lawson and Ian Hetherington. "We are currently writing software which will be ready for release in two to three weeks time," said Dare Lawson. "However, this is not games software, and probably not for the UK market either.

On the subject of the contraversial Finchspeed contract, he added, "There was never any doubt that the Megagames were with Imagine's receivers, because the contract between the two companies was not honoured."

Commodore sales boost

COMMODORE International has announced a large rise in both sales and profits for the year ending June 1984

Profits went up by 87 per cent, from $26.7m to $33.1m and sales reached $1.27bn, a rise of 66 per cent over the previous year's figure. The amount was boosted by sales of $300.3m in the final quarter.

First Star

◀ continued from page 1

option to take up UK rights all First Star games, so it should not be long before *Spy vs Spy* makes its appearance in this country. "We will be converting the First Star titles for the Spectrum, possibly in time for Christmas," continued John.

Astro Chase author, Fernando Herrera

"We also intend to begin releasing our own programs shortly, which would then be sold in the US by First Star."

Astro Chase and *Flip* and *Flop* should be available within the next week, priced at £8.95 (cassette) and £11.95 (disc).

Sinclair 5th generation

SINCLAIR'S research team, based at the company's Meta-Lab in Cambridge is working in conjunction with teams from British universities including Southampton, Edinburgh and Imperial College, London on the development of a fifth generation computer

The first Sinclair product to use the wafer-chip technology will — according to Su Chee, be the 0.5M memory expansion unit for the QL.


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Letters

Page the Amstrad?

I hope that undying loyalty to Sinclair will not spoil your good magazine. Week after week brings details of the QL's faults and shortcomings, but still a constant optimism that it will be 'everything we are looking for'.

My £229 has gone on the Amstrad as my Spectrum upgrade, and very impressive it seems too. I hope that it will receive the same respect and coverage as the QL, or isn't it serious enough because it doesn't say Sinclair on it?

How about an 'Amstrad Page' — or at least part of the QL's whole page?

A Piercy
c/o AMP
Avon House
360 Oxford St
London W1

I agree that the CPC 464 is well worth devoting space to in the magazine.

There is just one problem. Whereas QL owners appear to be a voluble lot, forever sending us programs they have written, Amstrad owners are so far keeping pretty 'stumm'. What about it?

Good clean smut

Following the letter recently published in August 2 concerning our game *Gusa Kiss (Code name Smut)* under the heading 'No sex please, ...from Christopher Bryant, we feel we must reply, and make the following comments: prude, bore, straight, Mary Whitehouse supporter, party pooper and kill joy.

But seriously folks... Out there, in the big wide world, there are people yearning for good clean smut. Judging by the sales, from what is our smallest ad ever, all we can say is "Never in the field of human conflict has so much been done by so few for so many."

Mike Potter and the infamous Mike O'Cain
Titan Programs
46 Market Place
Chippenham Wilts

Three into one

May I make a prophecy. Take three completely independent developments, put them together, and see where their combination will take us.

One: The Psion Organiser pocket computer. It costs under £100 (price is most important), with its "solid state drives" (vital to my concept) — only a maximum of 32K (16×2) memory admittedly, but with paging techniques such as those used on the Amstrad such limits can be overcome.

Two: Large sized cheapa liquid crystal displays. These need more memory than the Organiser has got, but that could be got round.

Three: Beyond's *Lords of Midnight* adventure game. Here is the first true 'book'-type adventure/story program. Playing this is like being inside a book, being one of the characters — living their lives, but influencing the plot by your actions (which is more than you could ever do reading a book).

Let's put these together and what do we have?

Just imagine sitting in the garden, unconnected by plastic umbilical-cords to any source of power — holding a paperback book-sized micro with a 6×3 inch dot-addressable LCD screen, playing a game such as *Lords of Midnight*. Or, in another context, using this machine with its interchangeable Roms and Ram as an interactive or 'expert system' textbook.

"The nest and eggs was safe but some collector stole my software"

Anyone who has sat in front of a crawling VDU will not mind the loss of colour. They know the drawbacks of microgaming as it is today — the aching feeling behind the eyes which heralds a visit to the local optician. In all my years of reading books I have never before had these problems. Using an LCD in screen in the peace of a sun-filled garden produces nothing but a feeling of "this is how it should be".

My prophecy: Before long there will be a cheap machine that will marry the micro and the book. And not until using a micro is as easy and as straight forward as using a book in every way ie, hand-held, no-fuss, take anywhere, immediate use and take-up of place where left-off (book-mark facility) will the micro truly have come of age.

Will someone — perhaps Psion — make it soon? And make themselves a great deal of money?

D A Austin
18 Stafford Avenue
Clayton
Newcastle-under-Lyme
Staffs

The facts of lite

I feel it is time the computer buying public were told a few of the facts of computer life.

The language used by machines such as The QL, and BBC is not Basic, but a Hybrid using functions filched from other languages. By no stretch of the imagination would I consider either machine suitable for a beginner, and yet the BBC appears among the limited choice offered to schools.

The purpose of these flybrids, we are told, is to facilitate 'structured programming, but a beginner is hardly likely to be a member of a programming team faced with debugging another's program. Structure can be helpful, but is not essential.

I would suggest that colour, sound, hi-res graphics, UDG, lower-case letters, Sprites, windows, and multi-tasking, do nothing whatever for computing: they are all concerned with the presentation of results on the TV screen. If you feel the need for all or any of these, then by all means get a computer that provides them, but be prepared to own a more complex computer. All of these features require additional programming for their use, and some machines make it much more difficult than others. None of them make it easier!

You cannot get much more basic than a ZX81, and after four years of serious Basic programming, there is only one word I would add to ZX81 Basic, *Else*, and this can be simulated with a couple of *Gotos*. If Basic had been intended as a structured language, then *Goto* would have been left out.

I wish Alan Turnbull had been more lucid (or I less thick) on the QL page in the August 2 issue as I would have liked to have tried a ZX81 simulation of some of his ideas. As it is the following program will solve factorials, and seems to satisfy the criteria for recursion, ie to use the same bit of program repeatedly: 10 INPUT A 20 LET B = A 30 FOR N = 1 TO A – 2 40 LET BV = B* (A – N) 50 NEXT N 60 PRINT " FACTORIAL ", A, " = " , B

I am surprised that Sir Clive should forsake the humble but powerful machine that started it all and made him a fortune. It's high time the ZX81 was reissued, with a decent keyboard, *Else*, and improved (medium resolution) graphics with at least 48K Rom.

W A George
10 Lonsdale Road
Stevenage
Herts SG1 5ES

Portuguese connection

I am a Portugese Spectrum owner, 18 years old, and I'd like to correspond with other Spectrum owners all over the world and exchange software — I have about 200 programs — and ideas.

Victor Jorge Esterao
Rua Jornal Correio
do Sul n°-33 1°d
8000 Faro
Portugal

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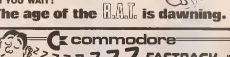
Look what the humans used to use for a joystick with their computer.

On August 22nd Cheetah Marketing will revolutionise the concept of joysticks.

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commodore



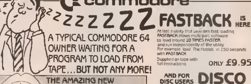
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Alien Raid

Pit your wits and reflexes against a bizzare array of mutants in Julian Henschke's game for the 48K Spectrum

This is an arcade-style game for the 48K Spectrum, in which you must protect your central life-support command base from attack. Various weird and wonderful aliens are seeking to destroy the base including octops, streamers, swarmers, bombers and a large cast of mutants.

Any aliens which escape your fire range will plant a time bomb at the base. Ten time bombs are enough to destroy the base.

The biggest danger is the Super Zapper, which may raid at any time with probable fatal consequences. Your only hope is to hit the computer assisted auto-zap button (H) which will immediately destroy it.

Take care when typing in the data statements, as some machine code is included.

Variables

AY, AX	Aliens y,x co-ordinates
SC	Current score
HI	Highest score
Bonus	Bonus awarded for completing all five waves
Land	Number of aliens landed
A	Current alien type
C	Number of aliens remaining in current wave



M	Aliens' random movement up/down
S	Score awarded for current alien
I	Ink colour of alien
L	Executes machine code
Peek 23300	Your X co-ordinate
Peek 23301	Your Y co-ordinate

Program notes

1-2	Sets up game
100-200	Main loop
400-440	Firing routine
450-455	Sound routine
800-810	'Do you want instructions?' and start game
600	Sets up variables
700-706	Instructions
800-810	Alien landing routine
900-999	Graphics/Machine code (key scan/print)
1000-1060	Sets up screen
1500-1530	Base destroyed/end routine
1700	Restart game

Last outpost of sanity

***Christina Erskine** dusts off her ZX81 and finds out what life is like down on Software Farm*



Software Farm's Julian Chappell

Back in the distant mists of time — three years ago — the ZX81 was launched. Over one million sales later although it now looks somewhat antiquated, and despite the hundreds of ZX81s that must be gathering dust in attics and under beds, there are those who have remained staunchly loyal to the Little Black Box.

Down on Software Farm, in Bristol, the launching of new machines and ever more colourful software has largely passed Julian Chappell by. To many, his decision to stay with ZX81 programming after the launch of the Spectrum must have seemed like commercial suicide, Julian is quietly convinced it has paid off.

"By the time the Spectrum was launched, we had four ZX81 games in our catalogue which were selling steadily," recalls Julian. "We knew we were in for a hard time when we took a stand at the next ZX Microfair — everyone was in a high state of expectation over the Spectrum, and our ZX81 stand was entirely ignored. Our sales plummeted and the company was only just surviving."

Nor were Software Farm's products at that time particularly impressive. Four arcade game conversions, each two years old, having been constantly revised and up-dated since their release.

It seemed as though only an EEC subsidy could save Software Farm. "I thought long and hard about jumping on the Spectrum bandwagon. But with everyone else doing so, I felt it would be better to stick to the ZX81 and I hoped that if everyone deserted it then we'd have a clear run."

So how would you put your stamp on a market in which your share had risen dramatically because competitors had moved on? No. Julian did none of these things. Software Farm didn't release another game for nine months.

However, when it finally did release the next game, *Forty Niner*, it represented something of a break-through for ZX81 programs, and kept Julian Chappell in business.

"I had been experimenting with the idea of using hi-res graphics on theZX81 for some time. After I realised that we were going to have to do something innovative if we were to be able to stay with the machine, I reckoned we could take a chance with developing hi-res programs. Eventually the bank agreed to support me, and Software Farm more or less went into hiding to develop two hi-res programs."

The way in which the high resolution graphics — almost unheard of on the ZX81 — is created sounds deceptively simple. The 50byte-long hi-res routine which redefines the screen map is incorporated into the games program. The ZX81's processor interrupts are jammed, so that every 50th of a second when the ZX81 would normally redefine its screen picture from software in the Rom, it instead uses Julian's definition in Ram.

After the success of *Forty Niner*, the Farm's second hi-res game, *Rocket Man*, is due for release soon, and Julian sees no reason at all to stop producing for the ZX81 as long as it continues to sell.

The Farm has also recently established its own ZX81 club. The company is a natural target for ZX81 owners, frustrated because of diminished support for their machine, who want information about peripherals and software still available. The Software Farm club is now the only UK user group dedicated solely to the ZX81. It has already attracted over a hundred members, each paying £2 for the privilege of discounts on Software Farm's games, a membership card, and its problem-solving service. The club, Julian insists, is in no way a money-spinner. It is clear that he is touched by the many letters he receives from ZX81 owners who now feel neglected and forgotten.

"We are now talking about converting games for the 16K Spectrum so I suppose we've finally succumbed, albeit slowly," he says almost regretfully. Software Farm — in something of a radical departure — is also planning an artificial intelligence add-on for the Spectrum. Said Julian, rather optimistically, "It will give the computer a brain, and the accompanying programs will enable the Spectrum to do things no-one else has tried yet."

Julian still feels happy that the Software Farm stuck with the ZX81. "Look at all the software houses which are having difficulties making ends meet at the moment. *Forty Niner*, in all honesty, may have sold peanuts compared to big Spectrum games. But it has sold steadily — now about 10,000 units."

Julian puts this down to being selective, going for quality rather than quality, and not expanding the business unless absolutely necessary. "As you can see, we haven't got flash offices, there aren't millions of members of staff, and I haven't rushed out to buy a new car."



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Drawing the line

Hardware *Trojan Light Pen* **Micro** Spectrum 48K **Price** £17.95 **Supplier** Trojan Products, 166 Derlwyn, Dunvant, Swansea, W Glamorgan SA2 7PF

Drawing on computers has been likened to knitting or weaving — the final laborious results must be pre-planned to precise x/y co-ordinates and manipulated remotely from the keyboard.

Not exactly conducive to the release of the creative spirit! Light pens supposedly change all that and more.

The Trojan Light Pen has the merit of simplicity and minimum cost. The outfit is neatly boxed and comprises the pen itself, a PP3 battery, tape software and an instruction leaflet. A lead from the pen plugs into the ear socket of the Spectrum and a second wire plugs into the battery.

The pen is controlled by the software supplied cassette — Basic plus 14K of machine code — so that virtually all the usual Spectrum Basic commands are effected by touching different boxes displayed in a panel at the bottom of the TV screen with the pen. The commands are *Box, Copy, Circle, Chr$, Draw, Erase, Fill, Ink, Line, Move 1st cursor, New picture, Paper, Move 2nd cursor, Tape, Load/Save picture* and *Erase*.

Box, Circle and *Line* are defined by the two *M* and *S* co-ordinate commands. Circles may be partially off the screen. Upper-case text can be included via the *Chr$* command anywhere on the screen. The colours (tones of grey in monochrome) for *Ink, Paper* and *Fill* are also selected by a touch of the appropriate coloured box at the bottom of the screen.

The *Draw* command permits direct sketching on to the TV. A small flickering portion of the screen, beneath the pen, is instantly converted into a plotted pixel and line as the pen is moved.

To get a smooth line is not as easy as it looks as the pixels move across the screen seemingly uncontrollably. Practice and a firm hand are needed. Fortunately the *Erase* command will delete the last instruction to the screen if unacceptable results are produced.

Any area bounded by a line or the screen edge can be filled in any ink colour but one is still limited to one ink and one paper colour per character square on the Spectrum. Considerable care is needed to get worthwhile results.

As a bonus the light-pen software routines can be merged into your own programs for light pen use.

We are all used to touching the screen with our fingers to demonstrate a point. Substituting a light pen could dispense with the keyboard (when used for *Inkey$*) in many educational programs and make the results much more interesting.

The Trojan light pen is well worth considering for budding computer artists and those exploring interactive computer control.

Maurice Gavin

FULL-TIME
PROGRAMMER REQUIRED

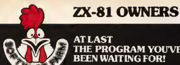
Palace Software are looking for another full time programmer to join the team.
An extensive knowledge of 6502 machine code programming is required.
The job would probably suit someone aged 18-25. Anyone who is afraid of hard work and occasional long hours to meet tight deadlines should not apply. Nor is it suitable for anyone who has ideas of vast salaries or driving a Lamborghini!

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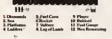




with Hi-Res Graphics on standard ZX-81 16K

Actual ZX-81 Screen Display!





1. Diamonds	5. Fuel Cans	9 Player
2. Sea	6. Rocket	10 Bubloid
3. Platforms	7 Vulture	11 Fuel Gauge
4 Ladders '	8. Leg of Lamb	12 Men Remaining



Get rich quick by collecting Diamonds that are simply lying there waiting for you!

Oh . I forgot to mention that there are one or two problems! There is an expanse of Shark infested water between you and the Diamonds and a strange breed of Bubble that seems hell bent on getting you in it! Somehow you must cross it. . .

You have a Rocket Pac to help you (a Vulture on higher levels) but you must rush around the platforms and ladders collecting cans of fuel (legs of lamb with the Vulture) and cursing that weird Bubble. Once you have enough fuel then it's Chocks Away!

Oh . . but don't run out of fuel on the way – otherwise it's . . . . SPLASH!

The aim is to collect all the diamonds from the far left hand side of the screen, whilst avoiding the rampant Bubloid These emerge from the sea and are hell bent on returning to their watery habitat with you in tow Sooner or later you are going to end up in the drink – The idea is to make it later!

By belting round the system of platforms and ladders, cleverly avoiding the Bubloid you collect the fuel cans which appear in random positions, until you consider that your fuel gauge indicates sufficient in the tank. Now you can go and collect your rocket With the rocket pack strapped to your back you can fly across the expanse of sea to collect the diamonds but don't run out of fuel or your rocket pack will simply disappear and you will wind up in the drink!

There are six stages with six different platform layouts. On stages 1 3 the Bubloid, which floats in front of the platforms with uncanny ease, gets an ever increasing ability to home in on your position, making the task of staying alive more demanding with each stage. On stages 4-6 you once again start with the easiest Bubloid (which is a blessed relief!) but the fuel cans are replaced by legs of lamb which you must collect to feed your vulture, and once it has enough energy (or you think it has!) you must flap across the water on its back to collect the diamonds.

Extra men are awarded for every 10 000 points – but <u>ONLY</u> once you have collected all the diamonds and so completed each particular stage

<u>GOOD LUCK!</u>

Available from all good computer shops or send cheque/P.O. for £5.95 (inc P&P) to:

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Software Farm, 155 Whiteladies Road, Clifton Bristol BS8 2RF
Telephone (0272) 731411 Telex 444742 AFMADV G

Guess what?

Program *Moons of Tantalus* **Price** £6.45 **Micro** Spectrum **Supplier** Cornhill Services, 2 Penrith Way, Aylesbury

The whole of the software industry seems to have taken great pleasure in the past in categorising products according to genre Hence the confusion that has meant many programs being hephazardly categorised as arcade/adventure when traditional arcade skills are mixed with the need for level headed adventure tactics. It also tends to suggest a certain degree of inherent quality — in the rich tradition of *Sabre Wulf*, *Atic Atak* etc *Moons of Tantalus* definately falls into the 'AA' category but I don't think it deserves that special stamp of 'quality' the term ordinarily implies

The action of the game consists of three screens of ludicrous simplicity, not so much the programming as the playing First you move a lorry backwards and forwards between a fuel shed and launch pad Secondly, you try to survive the revages of alien hordes in open space, using a cockpit display to locate one of the four moons upon one of which lurks an alien base. When you find it you get part three in which, guess what? You blast it to bits.

After ten or twenty minutes play the necessary skills will be acquired and you'll win every time Of course, you can select a higher skill level which will involve a much greater number of attempts before you win. But one wonders if it is really worth the boredom and suffering of playing the game over a long period of time

Gordon Sneddon

Saur

Program *Jolly Roger* **Micro** *Spectrum 48K* **Price** *£5.95* **Supplier** *Video Vault, 140 High Street West, Glossup, Derbyshire*

This was a bit of a let down. Jolly Roger is a classic example of a potentially interesting graphic adventure (with arcade sequences) which has been spoilt by a mixture of ignorance and haste.

The object of the game is to land upon various assorted islands, stumble across doubloons, ammunition food scorpions and all those other fun things that would make Errol Flynn feel at home From time to time you chance upon 'native' settlements, where a friendly native will emerge to offer information about the whereabouts of the treasure

But it's the presentation of the natives that worried me Not only is it "Um ugg me give help" and similar, but you are *positively encouraged* to ruthlessly butcher any lone native upon whom you chance (they have doubloons hidden in their loin cloths) It left a sour taste in this mouth at least

Gordon Sneddon

Being there

Program *The Waster* **Price** *Micro Spectrum 48K* **Supplier** *Harddata 230a Portway, Stratford, London E15*

The columns of *PCW* have frequently been filled with discussions of what characteristics make good adventure games. Personally, I find that no matter how well designed or logically stimulating a game may be, if it lacks atmosphere and a sense of involvement, then it is as nothing

Harddata therefore should be congratulated for this text-only adventure as, spelling mistakes notwithstanding, *The Waster* conveys such an engaging sense of 'being there' that I played it over and over and over again.

To summarise the plot, one assumes the role of an extremely efficient CIA assassin who must travel to Africa to eliminate the politically unsound leader of a certain state. The action takes place with a number of single-key commands which work in response to the most entertaining text that I have seen for some time

Before you can embark on your journey you must first survive the nightmares of previous missions moving from Ku Klux Klan lynchings to international gun runners Survive the night before an you 'qualify' for the mission.

And when your ex-wife empties your wallet of its $95 and still wants more, be careful, she keeps a loaded shotgun by her side

Gordon Sneddon

Fruit batty

Program *Mr Dig* **Price** £8.00 **Micro** Commodore 64 **Supplier** Microdeal, 41 Truro Rd, St Austell, Cornwall.

Mr Dig consists of a number of standard arcade game features plus a few new ones put together to make an enjoyable and entertaining game.

Mr Dig is fond of cherries, and your aim is to guide him over bunches of cherries while avoiding the various other characters in the game whose sole function is to stop him getting to the fruit. As well as cherries, there are some apples on the screen, not for picking but for pelting the meanies which not only gives them a nasty headache but also makes them disappear Mr Dig can also dispose of his opponents by throwing his power orb at them (the mind boggles!) At the centre of the screen there is a treat, like an ice cream.

Although the elements of the game are quite simple, it is well presented and designed. The graphics are colourful and the title screen appealing — something many programmers neglect. The game makes an entertaining change from many others on the market and with ten levels of difficulty it should suit most people

Richard Corfield

Reviews

Highlights

Program *Football Manager* **Micro** Commodore 64 **Price** £7 95 **Supplier** Addictive Games, 7a Richmond Hill, Bournemouth BH2 6HE

Some time ago I watched a friend of mine playing a really excellent game on his Sinclair Spectrum.

The game in question was *Football Manager* from Addictive Games and it has just been converted for the C64

In this game you play the part of the manager of the football team of your choice. You start the game in the Fourth Division with a squad of twelve players, and it is your responsibility to guide your lads through both league and cup competitions For each match you have to carefully select your team by judging the best combination of skill and fitness, bearing in mind the strengths and weaknesses of your opponents Having chosen your players, the match highlights are then displayed in very good animated 3D graphics. Other teams results are shown and full league tables are maintained so that you can always tell how well (or badly) you are doing

There are many other excellent features in this game, in fact the attention to detail is outstanding For example gates receipts, wage bills players morale strengths in attack mid-field and defence are all taken into account. If your favourite team and player - are not there, then you can even build your own

Richard Corfield

Spellbound

Program *Can You Spell?* **Micro** Oric/Atmos **Price** £3 95 **Supplier** Mellowsoft, 23 Dalford Court, Hollinswood, Telford Shropshire

You have control of the a laser cannon. A strange object appears in the right-hand corner of your view-screen You've seen it before ah yes! Using your skill and judgement you position the laser and fire Your aim may be true, but is it the right letter? The continual accompaniment of bells, whistles and clangs tell you that you hit the right target and the letter c' falls from the sky

Quickly you drive the lorry out of the factory, pick up the waiting letter and transport it back for enlargement The giant letter is then stacked at the bottom of the screen, and it's back to the laser cannon for the next letter

Finally you triumph you can spell 'cat', and you are just three years old.

Can You Spell? is an educational program by Mellowsoft for the Oric 1 and Atmos The program is just one of eight cassettes for three to eight year-olds released by the company, all priced at £3 95 They are well thought out, make interesting use of graphics and sound, and are good value

Can You Spell? is great fun, if a bit limited in the number of words and associated pictures.

What I liked about the program is the way it illustrates the principles of the subject, eg, when the letter is in the factory in order to enlarge the letter the corresponding key for that letter must be pressed.

Children will enjoy the repetitive graphics and sound and parents and teachers will like the way the child is encouraged to do more than just type in the answer

Vic Fielder

Macabre

Program *The Evil Dead* **Price** £6 99 **Micro** Commodore 64 **Supplier** Palace Software, 275 Pentonville Rd. London N1

I Have not seen the film on which *The Evil Dead* is based, so I do not know how faithful to the plot the game is, but it certainly sounds pretty macabre

A party of friends go to the Tennessee woodlands to stay in a remote hut which has been unused for many years Unfortunately, when they arrive they find that the hut is haunted by the spirit of the Evil Dead. In the game, you play the part of one of the group He has to defend himself and his friends from the Evil Dead. If the spirit gets his friends, they turn into evil mutants who try to attack him. He can defend himself with weapons which appear around the hut, such as an axe or a sword. If he kills a mutant, it turns into something else, like a pair of kicking legs or arms, which come after him again.

The plot is fairly chilling stuff, and the game is quite gripping as well There is no let up in the action — just when you think you have got rid of all the nasties, another lot appear and come after you again Fortunately, the graphics are not as gory as the plot, and the sound is standard arcade style The intro music is suitably threatening though Altogether, this is good arcade style action, distinguished by the horror movie plot

Richard Corfield

Wicked

Program *Gisburn's Castle* **Micro** BBC B **Price** £8.95 **Supplier** Software Communications, Martech House, Pavense Bay, East Sussex BN24 6EE

The wicked Guy of Gisburn has captured Maid Marion and holds her in his castle Armed only with your trusty strongbow you have to rescue her

It's an arcade game with adventure elements You wander through forest and castle grounds picking up objects as you go, shooting at and being shot by the guards Unfortunately you lose strength each time you are shot and if you're not careful you have to start again. This happened to me many times and it was a slow business building up a map of

the area. The objects appear at random so it is always necessary to cover a lot of ground without losing your strength. You can choose joystick or keyboard play and a level of skill.

I started off feeling very interested in this game, but my enthusiasm wore off with each repetition of 'shoot and avoid being shot'. But I do like the idea of mixing arcade and adventure themes in one game although I would prefer the balance to be on the adventure side. Great graphics though.

Jan Watterson

Way out

Program *West* **Micro** Commodore 64 **Price** £9.95 (cassette) £12.95 (disc) **Supplier** Talent Computer Systems, Freepost, Glasgow

The scene is the Wild West in 1884. You are on the trail of a gang of notorious outlaws who have robbed a bank and hidden themselves and their loot in an abandoned mining town. You have to recover as much of the loot as you can, while avoiding or out-shooting the gang. Finally, you have to escape from the town which is deep in Indian territory in order to complete your mission.

This is the screenplay of *West*, a new adventure from Talent Computer Systems.

Although you can wander into the country outside the town most of the action takes place around the derelict township itself. This consists of several streets and buildings laid out in quite a complicated plan. Each building usually has more than one room, so there are quite a few locations.

The game takes place in real time, so that other characters like the robbers or the Indians, have to be dealt with fast or you may end up dead. However, you can be killed thirty times before the game is stopped, so you can afford a few mistakes on the way.

Although this is a fairly standard text-based adventure it has a reasonable vocabulary (of between 200 and 300 words). Unfortunately there is no glossary, so you just have to figure out the commands for yourself.

The most striking feature is the excellent hi-res picture of the town, which forms the title screen and appears at intervals during the game with different colour schemas depicting the different times of day.

Richard Corfield

Inflommatory

Program *Hercules* **Price** £7.95 **Micro** Commodore 64 **Supplier** Interdisc 249-251, Kensal Road, London W10

One of the most frustrating things with many arcade games is having to start at the same level over and over again each time you get zapped. Some games designers overcome this problem by allowing you to select the starting level of the game. In *Hercules* from Interdisc, a different approach is used — the game itself randomly selects the starting point for you, which makes the play a lot more interesting, if a bit disorientating at first.

The labours of Hercules are the theme of the game. The twelve labours are presented on fifty screens, each labour taking about four screens to complete. You randomly start at the beginning of any one of the first eleven labours. The twelfth can only be started after the first eleven have been completed. To complete each task, you must reach the goal of the labour via platforms and ropes, while avoiding mythical beasts, falling rocks and other hazards. To add to the difficulty the platforms have a nasty habit of disappearing or bursting into flames when you least expect it.

Many of the screens are very difficult — often you have to leap into space hopefully as many of the platforms are invisible until you actually land on them.

This is an unusual and interesting game, which requires a fair degree of skill to play. The random start feature is an excellent idea, which certainly adds to the enjoyment. It is a pity that the graphics are not a bit more lively to look at — they are the weak point of a game which is otherwise very good.

Richard Corfield

Miner mole

Program *Monty Mole* **Micro** Spectrum 48K **Price** £6.95 **Supplier** Gremlin Graphics, Alpha House, 10 Carver Street, Sheffield.

You may have seen this one on ITV television news. Because Monty Mole is no ordinary multi-screen, *Manic Miner* inspired collect and dodge, superb graphics game. Monty Mole is political. The idea is that you move Monty Mole through a variety of tunnels and caverns (the mine) collecting various useful objects. His ultimate objective — the secret ballot.

Monty has to avoid flying pickets and tins of hairspray (this seemingly oblique reference relates to the later sequences of the game where Monty confronts Arthur in his castle.

Right. Now that you have had your political prejudices inspired or enraged by the news of the plot, on with the game itself. It is, in fact, superb. The graphics are of Ultimate quality and although it owes almost everything to *Manic Miner* — you collect things, avoid things, and the key to it all is knowing when to jump — the design of the game is so clever and the problems so fiendish that it has all the addictiveness of an original concept.

I spent quite a while declaring one part of the vast maze of interlocking patterns to be absolutely impassable before I realised in true *Manic Miner* fashion ... well if I jump just as I enter the screen in the middle of the rope before the *Pacman* type thing grabs me I'll be OK. I did and was promptly squashed in a crusher machine.

Ian Waltham

The speaking Spectrum

***David Laina** explains how to build your own low-cost RS-232 output port*

The software and hardware project described below allows the production quite cheaply of an RS232 output port operating from the Spectrum's *LList* and *LPrint* commands.

The system is 'blind' and the programs calling the interface *must* ensure that there is no data over-run.

Some knowledge of electronic construction and machine-code is assumed.

The RS232 serial signal is asynchronous signal. Characters are sent one bit at a time 'bit serially' the least significant bit is sent first, each character bit, '0' or '1', requires the same transmission time and all characters are preceded by a single mark or '1' bit and followed by one or more stop or '0' bit. The duration of each bit is 1/baud-rate seconds: at 110 baud each bit lasts 9.09 milli-seconds

You may need to tailor your version of the software routine in one or more of the following respects

1) If your printer has no input buffer, the character which takes the longest to execute will probably be the *CR/LF* or carriage-return/line-feed. It will be necessary to follow the *CR/LF* character(s) by a short pause to allow for their completion or the number of stop bits after each character is sent should be increased from the mandatory 1 or 2 to perhaps 7 or 8 this will slow the overall character rate by half

2) Your printer may demand a parity bit to be inserted after the mark stop (MS) bit and before the terminal stop bit(s) of each character

3) You may need to alter the output baud rate (this is the easy part) The *Wait* routine waits for one bit time and is set for 110 baud — this time should be accurate to with 4 per cent — for other baud rates use the values given. 75 baud — 164, 110 baud — 112, 135.5 baud — 91, 300 baud — 41 600 baud — 20 1200 baud — 103.

These values may need slight reduction at high baud rates but the basic timing is that of the Spectrum itself.

Hardware

Sinclair uses the Ear socket to output low-level signals for driving a cassette recorder The circuit shown performs two functions — impedence matching to avoid wave-form distortion and amplification/level shifting to give a suitable signal. Because RS232 signals go above and below earth the simplest (and safest) power supply is a 12 volt battery isolated from the earth. *You must* not use *the spectrum power supply* and should *not* use a car battery Due to the high source impedence of the Spectrum you ought to use this interface only on its own, with the recorder disconnected.

Note, however, that the Spectrum earth is connected to the peripheral signal earth.

The operational amplifier used in the circuit is the very common 741 The input 10K resistor protects the Spectrum and the output 1k resistor allows the output to be shorted to earth without damage to the 741 All resistors are ¼ or ½ watt rating.

Software

The software outputs bit four to port 254 the speaker/ear port of the Spectrum After the code has been loaded a call of *Randomise Usr 64000* performs 2 functions

1) It resets Ramtop to protect the code

2) It changes the address in the *Chans* area, of the routine used by the Spectrum for *LList* and *LPrint from 09F4h (2548 dec) to point to the new routine Newp* This address in the *Chans* area may change if you have microdrive

Calls on *LList/LPrint* will all now be diverted via *Newp* which is entered for each output character/token in sequence This character is to be found in the A register

Note that because Ramtop has been reset you can now use *New* without damage

Program notes

50 200 The initial set-up/protect routine

240-680 A contains the character token to be printed Graphics are omitted and tokens are selected for separate decoding at lines 330-570 The (C) symbol is treated as a make-believe token held at line 600 Remember that all tokens are terminated by having the MS bit set in their last byte in the Rom table at address 150)

700-1100 This outputs the bit stream in RS232 format, entry is with the byte in A. The *Start* mark is output at line 730 and the 8 (or 7) bits of A are output in sequence least significant first, via the conditional calls on *Mark* and *Space* at lines 770 and 780

860-1060 *The Mark and Space routines which hold the output high or low for a one-bit period. What is actually output here is determined by the design of the interface*

1070-1150 The Wait for one bit period Operates by the simple process of pre setting HL and subtracting 1s until zero is reached.

This is a very simple interface Have fun with it but do not expect too much, for instance you may have to start a message with a dummy character to ensure that the first text character is not lost, again you must find out exactly what control codes, if any your peripheral requires for certain effects

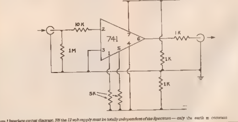


Figure 1 Interface circuit diagram. NB the 12 volt supply must be totally independent of the Spectrum — only the earth is common

```
ORG   64000
 0020 INIT  PUSH  AF
 0030       PUSH  DE
 0040       PUSH  HL
 0050             "Reset RAMTOP
 0060       LD    DE INIT 2
 0070       LD    HL 23730
 0080       LD    (HL) E
 0090       INC   HL
 0100       LD    (HL) D
 0110             "Set NEWP to be the new output routine"
 0120       LD    HL (23631)
 0130       LD    DE,15
 0140       ADD   HL DE
 0150       LD    BC NEWP
 0160       LD    (HL) E
 0170       INC   HL
 0180       LD    (HL) D
 0190       POP   HL
 0200       POP   DE
 0210       POP   AF
 0220       RET
 0230 .           'MICRO RS232 PORT COPYRIGHT D N LAINE 1984
 0240 NEWP  PUSH  AF
 0250       PUSH  HL
 0260       CP    127
 0270       JR    C,BYTE1
 0280             "Deal specially with COPYRIGHT symbol"
 0290       JR    Z CRITE
 0300       CP    165
 0310             "Omit graphics symbol"
 0320       JR    C BYTE2
 0330       SUB   165
 0340             "A contains the token sequence number"
 0350             "150 is head address of TOKEN decode table
                   now find the right part"
 0370       LD    HL 150
 0380 TLO   JR    Z TSPCK
 0390 TL1   BIT   7 (HL)
 0400       INC   HL
 0410       JR    Z TL1
 0420 TL2   DEC   A
 0430       JR    TLO
 0440             "SPACE inserted at start of TOKEN"
 0450 TSPCE LD    A " "
 0460       CALL  BYTEX
 0470             "Print the token"
 0480 TOKEN LD    A (HL)
 0490       AND   127
 0500       CALL  BYTEX
 0510       LD    A (HL)
 0520       BIT   7,A
 0530             "was last character as MS bit is set"
 0540       JR    NZ,BYTSP
 0550       INC   HL
 0560             "collect next TOKEN byte"
 0570       JR    TOKEN
 0580 CRITE LD    HL CTXT
 0590       JR    TOKEN
 0600 CTXT  DEFM  "COPYRIGHT"
 0610 .           "All token decodes end with MS bit set"
 0620       DEFB  128
 0630             "SPACE inserted at end of TOKEN"
 0640 BYTSP LD    A " "
 0650 BYTE1 CALL  BYTEX
 0660 BYTE2 POP   HL
 0670       POP   AF
 0680       RET
 0690             "Character output routine"
 0700 BYTEX PUSH  AF
 0710       PUSH  BC
 0720             "Output the initial MARK"
 730        CALL  MARK
 0740             "Change 8 to 7 for 7 bit characters"
 0750       LD    B,8
 0760 NXB   BIT   0,A
 0770       CALL  NZ,SPACE
 0780       CALL  Z MARK
 0790 WT    SRL   A
 0800       DJNZ  NXB
 0810       CALL  SPACE
 0820             "Add more SPACEs to reduce character rate
 0830       CALL  SPACE
 0840       POP   BC
 0850       POP   AF
 0860       RET
 0870             "Output MARK routine
 0880 MARK  PUSH  AF
 0890       PUSH  BC
 0900       LD    A,0
 0910       OUT   (254) A
 0920       CALL  WAIT
 0930       POP   BC
 0940       POP   AF
 0950       RET
 0960 .           "Output SPACE routine"
 0970 SPACE PUSH  AF
 0980       PUSH  BC
 0990             "16 is bit 4 for OUTPUT"
 1000       LD    A 16
 1010       OUT   (254) A
 1020       CALL  WAIT
 1030       POP   BC
 1040       POP   AF
 1050       RET
 1060             "WAIT for 1 bit period 1128-110 baud as"
 1070 WAIT  PUSH  BC
 1080       PUSH  HL
 1090       LD    HL 1128
 1100       LD    BC,1
 1110 WZ    SBC   HL BC
 1120       JR    NZ,WZ
 1130       POP   HL
 1140       POP   BC
 1150       RET
 1160       END
```

BYTE VALUES   COPYRIGHT D N.Laine 1984

ADDRESS			values			check
64000	245	213	229	017	254	ck- 0558
64005	249	053	178	092	115	ck- 0687
64010	035	114	082	079	092	ck- 0362
64015	017	015	000	025	017	ck- 007A
64020	029	250	113	035	116	ck- 0543
64025	225	209	241	201	245	ck- 1121
64030	229	254	127	056	057	ck- 0723
64035	060	098	254	165	056	ck- 0753
64040	054	214	165	033	150	ck- 0616
64045	000	040	088	203	128	ck- 0577
64050	055	040	251	061	024	ck- 0411
64055	246	062	032	205	068	ck- 0643
64060	250	138	230	127	205	ck- 0938
64065	088	250	126	203	127	ck- 0806
64070	032	018	035	024	242	ck- 0351
64075	033	080	250	024	237	ck- 0624
64080	067	079	080	069	080	ck- 0397
64085	073	071	072	084	128	ck- 0428
64090	062	032	205	098	250	ck- 0647
64095	225	241	201	245	197	ck- 1109
64100	205	128	250	066	098	ck- 0595
64105	203	071	188	128	250	ck- 0858
64110	204	124	250	203	083	ck- 0866
64115	016	246	205	128	250	ck- 0853
64120	205	138	250	193	241	ck- 1027
64125	201	245	197	062	008	ck- 0705
64130	211	254	205	150	250	ck- 1070
64135	193	241	201	245	197	ck- 1077
64140	062	016	211	254	205	ck- 0748
64145	150	250	193	241	201	ck- 1035
64150	197	239	033	104	004	ck- 0567
64155	001	001	000	237	066	ck- 0505
64160	032	252	225	193	201	ck- 0903

Window of opportunity

Adrian Warman concludes his two-part Commodore 64 windowing feature

This week we publish the second part of the assembly language listing for the 'windowing' program. The accompanying program notes are, I hope fairly comprehensive and should be self-explanatory

Also included is a list of labels used by the assembly language listing

For the benefit of those without an assembler, there is also a Basic loader program.

The short demonstration program will enable you to see how the windowing technique works in practice

2100–2160 All the window dimension data has now been found. The transfer process can now begin. First find the position of the window on the screen. Then add the current position of the character storage map (given by the system variable *Hibase*). This address is placed into *SRC*, since the data will come from this position.

2170 Transfers the window from *SRC* to *VEC*, using the sub-routine *Copy*

2180–2240 Reloads the position of the window, and adds a correction factor for the colour nybble store, then copies into the store using *Copy* again.

2280–2390 In order to reload the stored data, it is necessary to keep a record of the window data. This is stored after the actual screen data so that it can be accessed first during reload. Finally, the free location pointer *VEC* is updated, then the job is then completed.

2430-2490 Reloads a stored window. First checks that there is actually some window data stored. This is done by testing the current value of *VEC*. If *VEC* still points to $A000 then there is no data present and the command will be ignored.

2500–2520 If data is present, it switches out the Basic Roms to access the window

2530–2590 Moves *Vec* to point to start of dimension data storage

2600–2670 Reloads the dimension data back into XORIG,XSIZE, etc.

2680–3750 Finds the relative position of window on the screen. It calculates where this is in the colour nybble memory. *Src* is then used to place the data back into position by the *Get* sub-routine

2760–2820 Repeats the process for the character data back into the current character map (using *Hibase* again)

2830-2860 Switches the Basic Roms back again, and returns to Basic

2900–2920 Copies each row of the window until reaching the bottom of the window

2930–2970 Traverses the current row until reaching the last column of the window. Note that the first column of the window is treated as being column 0 because the actual column number is added into the calculations by sub-routine *Posn.*

2980–3020 Transfers the data byte, and updates the storage vector *Vec*.

3030–3020 Moves to the next column and repeats the transfer

3050–3100 Detects the end of the current row, and repeats until reaching the bottom of the window; then exits the routine

3160-3210 Preserves the contents of *Temp*, since it may still be required by the 'up-date' routine

3220–3210 Transfers and up dates *Temp* to *Src*, also reloads the stored *Temp* value from the stack. This manipulation of data is necessary, because the data must be reloaded 'backwards' as bottom corner first

3400–3420 Loads *X* with the row count. If there are no more rows to reload, it exits the routine

3430–3510 Makes the Src point to the start of the previous row — because the routine is reloading 'backwards

3520–3540 Sets *Y* to column count. While there are still columns to do on this row, it gets the data back to the screen stores.

3550–3600 Makes *Vec* point to the data byte. Gets the byte and places it back in position.

3610–3620 Moves to the next column.

3630–3660 Moves to the next row. If there are no more rows, exits routine.

```
2100 C08D 2039C0            JSR POSN
2110 C090 A5FB              LDA TEMP
2120 C092 85FD              STA SRC
2130 C094 A5FC              LDA TEMPHI     ; FIND SCREEN DATA.
2140 C096 18                CLC
2150 C097 6D8802            ADC $0288
2160 C09A 85FE              STA SRCHI
2170 C09C 204CC1            JSR COPY
2180 C09F A5FB              LDA TEMP       ; FIND COLOUR RAM
2190 C0A1 85FD              STA SRC
2200 C0A3 A5FC              LDA TEMPHI
2210 C0A5 18                CLC
2220 C0A6 69D4              ADC #$D4
2230 C0A8 85FE              STA SRCHI
2240 C0AA 204CC1            JSR COPY
2250 C0AD A200              LDX #$00       PRESERVE SIZE DATA.
2260 C0AF A000              LDY #$00
2270 C0B1 B5F7     KEEPON   LDA XORIG,X
2280 C0B3 91FD              STA (VEC),Y
2290 C0B5 E8                INX
2300 C0B6 C8                INY
2310 C0B7 E004              CPX #$04
2320 C0B9 D0F6              BNE KEEPON
2330 C0BB A5FD              LDA VEC        ; UPDATE STORE VECTOR.
2340 C0BD 18                CLC
2350 C0BE 6904              ADC #$04
2360 C0C0 85FD              STA VEC
2370 C0C2 9002              BCC STOREOUT
2380 C0C4 E6FE              INC VECHI
2390 C0C6 60       STOREOUT RTS
2400 C0C7
2410 C0C7          ; RELOAD STORED WINDOW
2420 C0C7          ;
2430 C0C7 A9A0     UPDATE   LDA #$A0       ; IS DATA PRESENT?
2440 C0C9 C5FE              CMP VECHI
2450 C0CB D007              BNE DOUP
2460 C0CD A900              LDA #$00
2470 C0CF C5FD              CMP VEC
2480 C0D1 D001              BNE DOUP
2490 C0D3 60                RTS
2500 C0D4 A501     DOUP     LDA $01        SWITCH OUT BASIC.
2510 C0D6 29FE              AND #%11111110
2520 C0D8 8501              STA $01
2530 C0DA A5FD              LDA VEC        ; RESET STORE POINTER
2540 C0DC 38                SEC
2550 C0DD E904              SBC #$04
2560 C0DF 85FD              STA VEC
2570 C0E1 A5FE              LDA VECHI
2580 C0E3 E900              SBC #$00
2590 C0E5 85FE              STA VECHI
2600 C0E7 A200              LDX #$00       RELOAD SIZE DATA.
2610 C0E9 A000              LDY #$00
2620 C0EB B1FD     RELOAD   LDA (VEC),Y
2630 C0ED 95F7              STA XORIG,X
2640 C0EF C8                INY
2650 C0F0 E8                INX
2660 C0F1 C004              CPY #$04
2670 C0F3 D0F6              BNE RELOAD
2680 C0F5 2039C0            JSR POSN
2690 C0F8 A5FB              LDA TEMP
2700 C0FA 85FD              STA SRC
2710 C0FC A5FC              LDA TEMPHI     FIND COLOUR MAP.
2720 C0FE 18                CLC
2730 C0FF 69D4              ADC #$D4
2740 C101 85FE              STA SRCHI
2750 C103 204AC1            JSR GET
2760 C106 A5FB              LDA TEMP       FIND SCREEN RAM
2770 C108 85FD              STA SRC
2780 C10A A5FC              LDA TEMPHI
2790 C10C 18                CLC
2800 C10D 6D8802            ADC $0288
2810 C110 85FE              STA SRCHI
2820 C112 204AC1            JSR GET
2830 C115 A501              LDA $01        ; REPLACE BASIC ROMS
2840 C117 0901              ORA #%00000001
2850 C119 8501              STA $01
2860 C11B 60                RTS
2870 C11C
```

```
2860 C11C          ; COPY SCREEN TO STORE
2870 C11C          ;
2900 C11C A200     COPY       LDX #$00          ; ROW COUNT.
2910 C11E E4FA     COUTER     CPX YSIZE
2920 C120 B0E7                BCS CENDOUTER
2930 C122 8602                STX CALC
2940 C124 A200                LDA #$00
2950 C126 A000                LDY #$00          ; COLUMN COUNT
2960 C128 C4F9     CINNER     CPY XSIZE
2970 C12A B00A                BCS CENDINNER
2980 C12C B1FB                LDA (SRC),Y         STORE DATUM
2990 C12E 81FD                STA (VEC,X)
3000 C130 E6FD                INC VEC           ; UPDATE STORE VECTOR
3010 C132 D002                BNE CHOUPDATE
3020 C134 E6FE                INC VECHI
3030 C136 C8       CHOUPDATE  INY                 CONTINUE COLUMNS
3040 C137 D0EF                BNE CINNER
3050 C139 A928     CENDINNER  LDA #$28            FIND NEXT ROW
3060 C13B 18                  CLC
3070 C13C 65FB                ADC SRC
3080 C13E 85FB                STA SRC
3090 C140 9002                BCC CCARRY
3100 C142 E6FC                INC SRCHI
3110 C144 A602     CCARRY     LDX CALC            CONTINUE ROWS
3120 C146 E8                  INX
3130 C147 D0D5                BNE COUTER
3140 C149 60       CENDOUTER  RTS
3150 C14A
3160 C14A          ; COPY STORE TO SCREEN.
3170 C14A          ;
3180 C14A A50C     SET        LDA TEMPHI
3190 C14C 48                  PHA
3200 C14D A50B                LDA TEMP
3210 C14F 48                  PHA
3220 C150 A4FA                LDY YSIZE
3230 C152 2023C0              JSR MULY
3240 C155 C60B                DEC TEMP
3250 C157 A9FF                LDA #$FF
3260 C159 C50B                CMP TEMP
3270 C15B D002                BNE NOTH1
3280 C15D C60C                DEC TEMPHI
3290 C15F A50B     NOTH1      LDA TEMP
3300 C161 18                  CLC
3310 C162 65FB                ADC SRC
3320 C164 85FB                STA SRC
3330 C166 A50C                LDA TEMPHI
3340 C168 65FC                ADC SRCHI
3350 C16A 85FC                STA SRCHI
3360 C16C 68                  PLA
3370 C16D 850B                STA TEMP
3380 C16F 68                  PLA
3390 C170 850C                STA TEMPHI
3400 C172 A200                LDX #$00
3410 C174 E4FA     SOUTER     CPX YSIZE
3420 C176 B028                BCS SENDOUTER
3430 C178 8602                STX CALC
3440 C17A A200                LDX #$00
3450 C17C A5FB                LDA SRC
3460 C17E 38                  SEC
3470 C17F E928                SBC #$28
3480 C181 85FB                STA SRC
3490 C183 A5FC                LDA SRCHI
3500 C185 E900                SBC #$00
3510 C187 85FC                STA SRCHI
3520 C189 A4F9                LDY XSIZE
3530 C18B C001                CPY #$01
3540 C18D 900D                BCC SENDINNER
3550 C18F A5FD     SINNER     LDA VEC
3560 C191 D002                BNE DECLO
3570 C193 C6FE                DEC VECHI
3580 C195 C6FD     DECLO      DEC VEC
3590 C197 A1FD                LDA (VEC,X)
3600 C199 91FB                STA (SRC),Y
3610 C19B 88                  DEY
3620 C19C D0F1                BNE SINNER
3630 C19E A602     SENDINNER  LDX CALC
3640 C1A0 E8                  INX
3650 C1A1 D0D1                BNE SOUTER
3660 C1A3 60       SENDOUTER  RTS
```

Labels

```
C058 SAVVAL      C003 CALC        C144 CCARRY      C139 CENDINNER
C149 CENDOUTER   C128 CINNER      C136 CHOUPDATE   C11C COPY
C11E COUTER      C195 DECLO       C0E4 DOUP        C19E SENDINNER
C1A3 SENDOUTER   C14A SET         C09A RETVAL      C18F SINNER
C174 SOUTER      C000 INIT        C081 KEEPON      C023 MULY
C029 NEXT        C15F NOTH1       C039 POKN        C049 POKNOUT
C0EA RECDON      C009 SCRN        C050 SKIP        00FB SRC
00FC SRCHI       C016 START       C003 STBD        C058 STORE
C0C6 STOREOUT    C087 STRSCRN     000B TEMP        000C TEMPHI
C0C7 UPDATE      C0C6 UPDT        00FD VEC         00FE VECHI
00F7 XORIG       00F9 XSIZE       00F9 YORIG       00FA YSIZE
```

Basic loader program

```
1000 REM BASIC SCREEN SAVER PROGRAM
1010 :
1020 REM BY A NAYMAN.
1030 :
1040 DATUM=0
1050 SUM=0
1060 :
1070 PRINT "LOADING DATA."
1080 :
1090 FOR LOC=49152 TO 49571
1100  READ DATUM
1110  SUM=SUM+DATUM
1120  POKE LOC,DATUM
1130 NEXT LOC
1140 :
1150 IF SUM<>59595 THEN PRINT "SUM ERROR "
1160 STOP
1170 :
1180 :
1190 DATA  76, 26,192, 76, 41,192, 76,199,192,169,  0,133,247,133,248,169
1200 DATA  40,133,248,169, 25,133,250, 76,130,192,169,  0,133,253,169,160
1210 DATA 133,254, 96,132,  2,167,  0,162,  0, 70,  2,144,  3, 24,105, 40
1220 DATA 106,102,139,202,208,243,133,140, 96,164,249, 32, 35,192,165,139
1230 DATA  24,101,247,133,139,144,  2,230,140, 96, 32,253,174, 32,138,173
1240 DATA  32,247,183,201,  0,208,  1, 96, 76, 72,178, 32, 74,192,192, 40
1250 DATA 176,246,132,247, 32, 74,192,132,248,152, 24,101,247,201, 41,176
1260 DATA 231, 32, 74,192,192, 25,176,224,132,249, 32, 74,192,132,250,152
1270 DATA  24,101,249,201, 26,176,209,165,250,201,164,176,203, 32, 57,192
1280 DATA 165,139,133,251,165,140, 24,109,136,  2,133,252, 32, 20,193,165
1290 DATA 139,133,251,165,140, 24,105,216,133,252, 32, 28,193,162,  0,160
1300 DATA   0,161,247,145,253,232,200,224,  4,208,246,165,253, 24,105,  4
1310 DATA 133,253,144,  2,230,254, 96,169,160,197,254,208,  7,167,  0,197
1320 DATA 253,208,  1, 96,165,  1, 41,254,133,  1,165,253, 88,253,  4,133
1330 DATA 253,165,254,253,  0,133,254,162,  0,160,  0,177,253,149,247,200
1340 DATA 232,192,  4,208,246, 32, 57,192,165,139,133,251,165,140, 24,109
1350 DATA 216,133,253, 32, 74,193,169,139,133,251,165,140, 24,109,136,  2
1360 DATA 133,252, 32, 74,193,169,  1,  9,  1,133,  1, 96,162,  0,250,250
1370 DATA 176, 39,134,  2,162,  0,160,  0,196,248,176, 13,177,251,129,253
1380 DATA 230,253,208,  2,230,254,200,208,239,167, 40, 24,101,251,133,251
1390 DATA 144,  2,230,252,168,  2,232,208,213, 96,165,140, 72,165,139, 72
1400 DATA 164,250, 32, 35,192,170,139,169,253,197,139,208,  2,198,140,165
1410 DATA 139, 24,101,251,133,251,165,140,101,250,133,252,104,133,139,104
1420 DATA 133,140,162,  0,228,250,176, 43,134,  2,162,  0,165,251, 56,253
1430 DATA  40,133,251,165,252,233,  0,133,252,164,240,192,  1,144, 15,165
1440 DATA 253,208,  2,198,208,148,253,161,253,145,251,136,208,241,166,  2
1450 DATA 232,208,209, 96
READY.
```

Demonstration program

```
1000 SYS 49152
1010 PRINT CHR$(147);
     CHR$(13);CHR$(13)
1020 FOR COL=0 TO 15
1030  POKE 646,COL
1040  FOR NUM=1 TO 12
1050   PRINT NUM;
1060  NEXT NUM
1070  PRINT
1080 NEXT COL
1090 PRINT"PRESS ANY
     KEY TO STORE."
1100 GET IN$
1110 IF IN$="" THEN
     GOTO 1100
1120 SYS 49161
1130 PRINT CHR$(147);
     "PRESS ANY KEY
     TO RETRIEVE."
1140 GET IN$
1150 IF IN$="" THEN
     GOTO 1140
1160 SYS 49158
```



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Of sound mind

*In the final part of their series, **Jason Orbaum and Geoffrey Campbell** look at Dragon sound routines*

This week we look at sound generation from machine code. The relevant chip in the Dragon is called (by those in the know) an analog multiplexer and controls from whence the sound is to come. The three locations in this chip that are of interest to us are *Sel1*, *Sel2* and *BDA* which are, respectively, locations 65281, 65283, and 65315. By configuring these chips in various ways we can select the sound source we require according to the table at **Fig 1.** All are normally set at zero as can be concluded from the Figure.

The Bit in each of these chips that is important is *Bit 3* ie, the bit worth 8 in decimal. The sound generation that we require is 6-bit D/A. We must therefore set *Bda*. To disable the interrupt (and prevent irritating clicks at high frequencies) we clear the top bit of *Sel2*.

Now to generate sound we store a value (0-255) in location 65312. The value determines the volume of the click that is produced through the speaker. As sound is a wave motion, the pitch is determined by the number of these clicks produced per second, or the frequency. In the routine provided, the X register holds the length of a pause between clicks, and the Y register holds the total number of clicks. It is therefore quite easy with a bit of experimentation, to produce a note of the right pitch and duration. It should be pointed out that as the pitch rises, more clicks are needed (ie the contents of the Y register increase) to produce a note of the same duration.

In our earlier program, *Blitz*, there are several different sound routines, all of which are variations on the method outlined above. *Zap* starts with a high-pitched note, which decreases in pitch over a fraction of a second. *Bang* is a white-noise generator, which fades in volume. White-noise is a sound with a random, constantly varying pitch and volume. You should be able to work out how *Humm* works, as it is a variation on *Beep*.

Fig 1

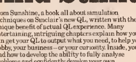
SEL1	SEL2	BDA	Sound source selected.
0	0	1	6 Bit D/A
1	0	1	Cassette
0	1	0	Cartridge (extension chip)
0	0	0	Silence

```
2711 *
2711 * BEEP.  LOAD X WITH PITCH.
2711 * Y WITH DURATION, AND B WITH
2711 * VOLUME.
2711 *
2711 3402    BEEP   PSNS  A
2713 B6FF23         LDA   65315
2716 8A08           ORA   #8
2718 B7FF23         STA   65315
271B B6FF03         LDA   65283
271E 84FE           ANDA  #254
2720 B7FF03         STA   65283
2723 F7FF20  LOOP   STB   65312
2726 8D1C           BSP   DELAY
2728 7FFF20         CLR   65312
272B 8D17           BSR   DELAY
272D 313F           LEAY  -1,Y
272F 26F2           BNE   LOOP
2731 B6FF23         LDA   65315
2734 84F7           ANDA  #247
2736 B7FF23         STA   65315
2739 B6FF03         LDA   65283
273C 8A01           ORA   #1
273E B7FF03         STA   65283
2741 3502           PULS  A
2743 39             RTS
2744 3410    DELAY  PSHS  X
2746 301F    DLOOP  LEAX  -1,X
2748 26FC           BNE   DLOOP
274A 3510           PULS  X
274C 39             RTS
274D
```

```
BASIC LOADER PROGRAM.

  0 PEM BEEP
  5 CLEAR 200, 10000
    CS=0
 10 FOR N=10001 TO 10061
 20 PEAD A$
 30 A=VAL("&H"+A$)
 40 POKE N,A
 50 CS=CS+A
 60 NEXT N
 70 IF CS<>7161 THEN
    SOUND 1,1 PPINT"DATA
    EPROP.":END
 80 PRINT"ALL CORRECT"
    :SOUND 200,1 END
 90 DATA 34,2,B6,FF,23,
    8A,8,B7,FF,23,B6,FF
    ,3,84,FE,B7,FF,3,F7,FF
100 DATA 20,8D,1C,7F,FF,
    20,8D,17,31,3F,26,F2,
    B6,FF,23,84,F7,B7,
    FF,23
110 DATA B6,FF,3,8A,1,B7,
    FF,3,35,2,39,34,10,
    30,1F,26,FC,35,10,39
120 DATA 39,0
```

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Proceeding nicely

Microdrive operation made easy with a useful procedure utility written by ***Bob Gavin***

The program defines eighteen short utilities making QL operation simpler and combines them in single procedure operator program — *User Procedures*.

After the program is loaded any of the routines — for example printing a microdrive directory or formatting a blank cartridge — can be carried out using only a couple of simple key-presses.

A while back when I was using my Sinclair Spectrum I decided that it would be a good idea to define numeric variables such and set them equal to the respective starting line numbers of a *Gosub* routines within a program that executed such 'procedures' — the idea being to call such procedures or *Gosub* routines as required.

Then along came the QL with its *DEFine PROCedure* command, an answer to all my problems.

Wouldn't it be nice, I thought, if I could just type *D1* for a directory listing of microdrive 1 instead of the long-winded command necessary.

See for yourself what the results of such thinking by typing in the listing below. It may not be the best solution but I find *User Procedures* very useful. It would be easy to extend the program to include additional procedures.

Points you should be aware of include:

1) I have an early version of the QL where the co-ordinates of the *At* command are reversed. If your machine is without the dongle swap these values round for each *At* command.

2) Beware of using procedures or variables with the same name as those in *User Procedures*. Errors may be abundant.

3) Type *Help* if you find yourself in difficulties, this will display the Help Screen.

4) Occasionally the *Save* procedures do not work first time around. If this occurs use the *Retry* command. I am told this is not a problem on the most recent versions of the QL.

5) The *Clear* command tends to sort out problems if your machine is acting up. Use it when all else fails.

6) The program is called 'boot' and as such may be loaded in the same manner as the packages supplied with the QL.

7) The £ sign in the listing should be typed in as a $ sign.

8) *User Procedures* starts at line 29999. No program should be loaded subsequently which use these line numbers greater than 29999.

The following is a list of key-presses and their functions:

Press	Routine
L1	Loads from mdv1
L2	Loads from mdv2
D1	Directory of mdv1
D2	Directory of mdv2
S1	Saves program to mdv1
S2	Saves program to mdv2
DEL1	Delete from mdv1
DEL2	Delete from mdv2
SPROC	Save current user procedures
DPROG	Deletes current program from memory
DTE	Sets clock
R	Run program
L	List program
F2	Format mdv2
C1	Copy from mdv1 to mdv2

```
29999 INTRO
30000 REMark ****************************************************
30005 DEFine PROCedure INTRO
30010 MODE 4
30015 SCREEN1
30020 BLOCK 511,95,0,100,4
30025 CSIZE 3,1
30030 AT 9,1
30035 PRINT "W E L C O M E"
30040 AT 14,3
30045 PRINT "T O"
30050 AT 12,5
30055 PRINT "U S E R"
30060 AT 8,7
30065 PRINT "P R O C E D U R E S"
30070 CSIZE 0,0
30075 INK 0
30080 PAPER 4
30085 AT 20,17
30090 PRINT "THE SYSTEM CLOCK IS SET AS"
30095 AT 31,19
30100 PRINT DATE$
30105 AT 26,21
30110 PRINT "Press  SPACE  to change date or"
30115 AT 26,22
30120 PRINT "Press any other key to continue"
30125 AT 36,24
30130 PRINT "VERSION 1 01"
30135 IF INKEY$="" THEN GO TO 30095
30140 IF KEYROW(1)=64 THEN DTE
30145 HELP
30150 END DEFine INTRO
30155 REMark ****************************************************
30160 DEFine PROCedure DTE
30165 SCREEN2
30170 PRINT "CHANGE DATE"
30175 PRINT
30180 INPUT "YEAR        (YYYY) = ";YEAR
30185 INPUT "MONTH         (MM) = ";MONTH
30190 INPUT "DAY           (DD) = ";DAY
30195 INPUT "HOURS         (HH) = ";HOURS
30200 INPUT "MINUTES       (mm) = ";MINUTES
30205 PRINT "ONCE THE VALUE FOR SECONDS IS INPUT THEN THE SYSTEM CLOCK WILL BE SET"
30210 INPUT "SECONDS       (ss) = ";SECONDS
30215 SDATE YEAR,MONTH,DAY,HOURS,MINUTES,SECONDS
30220 PRINT
30225 PRINT "THE SYSTEM CLOCK IS SET AS"
30230 AT 6,11
30235 PRINT DATE$
30240 PRINT
30245 PRINT "Press any key to continue"
30250 IF INKEY$="" THEN GO TO 30235
30255 HELP
30260 REMark ****************************************************
30265 DEFine PROCedure ENTER
30270 CLS
30275 PRINT "ENTER FILE NAME ";
30280 END DEFine ENTER
30285 REMark ****************************************************
30290 DEFine PROCedure L1
30295 LOCal X$
30300 ENTER
30305 PRINT "TO BE LOADED FROM MDV1_"
30310 INPUT X$
30315 MERGE "MDV1_"&X$
30320 RUN
30325 END DEFine L1
30330 REMark ****************************************************
30335 DEFine PROCedure L2
30340 LOCal X$
30345 ENTER
30350 PRINT "TO BE LOADED FROM MDV2_"
30355 INPUT X$
30360 MERGE "MDV2_"&X$
30365 RUN
30370 END DEFine L2
30375 REMark ****************************************************
30380 DEFine PROCedure D1
30385 CLS
30390 PRINT "DIRECTORY MDV1_"
30395 DIR MDV1_
30400 END DEFine D1
30405 REMark ****************************************************
30410 DEFine PROCedure D2
30415 CLS
30420 PRINT "DIRECTORY MDV2_"
30425 DIR MDV2_
30430 END DEFine D2
30435 REMark ****************************************************
30440 DEFine PROCedure S1
30445 LOCal X$
30450 ENTER
30455 PRINT "TO BE SAVED TO MDV1 "
30460 INPUT X$
30465 SAVE "MDV1_"&X$, TO 29999
30470 HELP
30475 END DEFine S1
30480 REMark ****************************************************
30485 DEFine PROCedure S2
30490 LOCal X$
30495 ENTER
30500 PRINT "TO BE SAVED TO MDV2 "
30505 INPUT X$
30510 SAVE "MDV2_"&X$, TO 29999
30515 HELP
30520 END DEFine S2
30525 REMark ****************************************************
30530 DEFine PROCedure DEL1
30535 LOCal X$
30540 ENTER
30545 PRINT "TO BE DELETED FROM MDV1 "
30550 INPUT X$
30555 DELETE "MDV1_"&X$
```

```
30560 HELP
30565 END DEFine DEL1
30570 REMark ****************************************
30575 DEFine PROCedure DEL2
30580 LOCal X$
30585 ENTER
30590 PRINT "TO BE DELETED FROM MDV2_"
30595 INPUT X$
30600 DELETE "MDV2_"&X$
30605 HELP
30610 END DEFine DEL2
30615 REMark ****************************************
30620 DEFine PROCedure SPROC
30625 CLS
30630 PRINT "SAVING CURRENT PROCEDURES  ."
30635 DELETE mdv1_boot
30640 SAVE mdv1_boot
30645 HELP
30650 END DEFine SPROC
30655 REMark ****************************************
30660 DEFine PROCedure DPROG
30665 CLS
30670 PRINT "DELETEING CURRENT PROGRAM   "
30675 LRUN mdv1_boot
30680 END DEFine DPROG
30685 REMark ****************************************
30690 DEFine PROCedure R
30695 RUN
30700 END DEFine R
30705 REMark ****************************************
30710 DEFine PROCedure L
30715 LIST
30720 END DEFine L
30725 REMark ****************************************
30730 DEFine PROCedure F2
30735 LOCal X$
30740 CLS
30745 PRINT "FORMAT MDV2 "
30750 PRINT "ENTER MICRODRIVE FORMAT NAME"
30755 INPUT X$
30760 FORMAT "MDV2_"&X$
30765 HELP
30770 END DEFine F2
30775 REMark ****************************************
30780 DEFine PROCedure HELP
30785 SCREEN2
30790 PRINT "HELP"
30795 PRINT "INTRO    Introduces user procedures and option to
set clock
30800 PRINT "L1       LOAD from mdv1_"
30805 PRINT "L2       LOAD from mdv2_"
30810 PRINT "D1       DIRectory of mdv1_"
30815 PRINT "D2       DIRectory of mdv2_"
30820 PRINT "S1       SAVE to mdv1_"
30825 PRINT "S2       SAVE to mdv2_"
30830 PRINT "DEL1     DELETE from mdv1_"
30835 PRINT "DEL2     DELETE from mdv2_"
30840 PRINT "SPROC    SAVE current user procedures
30845 PRINT "DPROG    DELETE current program from memory"
30850 PRINT "DTE      Date clock"
30855 PRINT "R        RUN program"
30860 PRINT "L        LIST program"
30865 PRINT "F2       FORMAT mdv2_"
30870 PRINT "C1       COPY from mdv1_ to mdv2_"
30875 PRINT "HELP     Displays this screen"
30880 PRINT "Choose desired option"
30885 END DEFine HELP
30890 REMark ****************************************
30895 DEFine PROCedure C1
30900 ENTER
30905 PRINT "TO BE COPIED FROM MDV1_ TO MDV2_"
30910 INPUT X$
30915 COPY "MDV1_"&X$ TO "MDV2_"&X$
30920 HELP
30925 END DEFine C1
30930 REMark ****************************************
30935 DEFine PROCedure SCREEN1
30940 WINDOW £1,512,256,0,0
30945 PAPER 2
30950 INK 7
30955 CLS
30960 END DEFine SCREEN1
30965 REMark ****************************************
30970 DEFine PROCedure SCREEN2
30975 SCREEN1
30980 WINDOW £0,452,32,30,224
30985 WINDOW £1,452,208,30,16
30990 WINDOW £2,452,208,30,16
30995 PAPER £0,2
31000 INK £0,7
31005 CLS £0
31010 PAPER £2,0
31015 INK £2,4
31020 CLS £2
31025 CLS
31030 END DEFine SCREEN2
31035 REMark ****************************************
```






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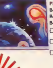
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Command performance

***Charis Charalambous** attempts to unravel the complexities of the BBC's envelope-shaping sound commands*

While the BBC has a very powerful enveloping facility, it is unfortunately complicated and difficult to master. This program makes enveloping much easier and simpler.

It will enable you to alter any parameter on Envelopes 1 to 4, together with any parameter on any channel at any time. Use of sound will not affect the program.

It will accept any correct variable, and if you type in something 'wild', the program will tell you the allowed range on the current variable.

It will run on both the Model A and Model B (O/S 1.0 and 1.2).

Program notes

290	*Defprocset*	sets keys F0-F9 to produce ascii, 193 and also sets initial envelopes
560	*Deffnok (A,B,X)*	checks that x is between A and B
590	*Defprocchoose*	accepts response from keyboard
1510	*Defprocwr (1,11)*	outputs on screen the allowed range for the current parameter within the allowed boundaries of 1 to 11
1570	*Defprocupdate*	updates the current envelope on screen
1730	*Defprocsound*	updates the current envelope parameters
1830	*Defprocso (h%)*	plays sound channel h%
1880	*Defprocso-off*	switches off all sounds

```
10REM************************************
20REM* BBC(B) O.S 1.2
30REM* ENVELOPE DEFINER
40REM* Charis Charalambous..(c)
50REM* ADRESS:
60REM* Byzinou 1a,
70REM* 40 Eklisies,
80REM* Thessaloniki,
90REM* GREECE.
100REM***********************************

110*TV255,1
120MODE1
130PROCSET
140PROCINSTR
150PROCDISPLAY
160PROCUPDATE(Z%)
170PROCUPDATE_SOUND
180PROCCHOOSE
190**************************************

200DEFPROCDISPLAY
210COLOUR2:PRINTTAB(2,1)"ENVELOPE
   DEFINER--Charis(11/2/84)"
220COLOUR3
230 FOR FX=8 TO 386 STEP6:PRINTTAB(F%,4)"(     )
   "TAB(F%,6)"(     )":NEXT
240FOR F%=2%6 TO 386 STEP6:PRINTTAB(F%,8)"
   (     )":NEXT
250FOR F=0 TO 3:PRINTTAB(0,12+3*F)"Channel ";F;
   FOR J=0 TO 3:PRINTTAB(12+J*6,12
+3*F)"(     )":NEXT,
260PRINTTAB(0,4)"(     )"
270ENDPROC
280**************************************

290DEFPROCSET
300DIM E%(72)
310A%=2:Y%=3:@%=0
320*FX4,1
330*K.0 !!A
340*K.1 !!B
350*K.2 !!C
360*K.3 !!D
370*K.4 !!E
380*K.5 !!F
390*K.6 !!G
400*K.7 !!H
410*K.8 !!I
420*K.9 !!J
430VDU23,8202;0;0;0;
440VDU23,255,24,60,126,255,24,24,24,24
450VDU19,1,2;0;
460*FX21,0
470FORF=1TO72:READ E%(F):NEXT
480DATA1,1,6,-4,4,10,20,10,127,0,0,-5,126,126,0,
   -4,100,6,1,3,100,6,2,2,100,6,3,1,100,6
490DATA2,8,1,-1,1,1,1,1,121,-10,-5,-2,40,40
500DATA3,1,-26,-36,-45,255,255,255,127,0,0,-127,126,0
510DATA4,7,2,1,1,1,1,1,121,-10,5,2,120,120
520FOR Z%=31 TO 59 STEP14:PROCSOUND:NEXT
530Z%=1:PROCSOUND
540 ENDPROC
550**************************************

560DEFFNOK(A,B,X)
570 IF B>=X AND A<=X =TRUE ELSE=FALSE
580**************************************

590DEFPROCCHOOSE
600COLOUR3
610PRINTTAB(A%,Y%)CHR$255
620A$=GET$:D%=ASC(A$)
630IF D%=193 PROCSO(0)
640IF D%=194 PROCSO(1)
650IF D%=195 PROCSO(2)
660IF D%=196 PROCSO(3)
670IF D%=197 PROCSO_OFF
680PRINTTAB(A%-1,Y%)SPC(3)
690IF D%=202 A%=2:Y%=3
700A%=A%+6*(INKEY(-26)-INKEY(-122))
710Y%=Y%+(2-(Y%>=13))*(INKEY(-58)-INKEY(-42))
720IF A%>=32 A%=32 ELSE IF A%<=2 A%=2
730IF Y%=11 Y%=13 AND INKEY(-42)
740IF Y%>22 Y%=22
750IF Y%=10 Y%=9
760IF Y%<=3 Y%=3
770IF Y%=9 AND A%<=14 A%=14 ELSE IF Y%=9 AND A%>=20 A%=20
780IF Y%>9 AND A%<=20 A%=20
790 JJ=1+(A% DIV 6)-6*(Y%=7)
800 IF Y%=9 JJ=11+A% DIV6
810IF Y%>12 JJ=9+A% DIV 6+((Y%-10) DIV 3)*4
820 IF FNOK(48,57,ASC(A$)) OR A$="-"PROCGET:COLOUR3
830GOTO600
840**************************************

850DEFPROCGET
860IF JJ<13 AND JJ>30 TEMP=E%(JJ+Z%-1) ELSE TEMP=E%(JJ)
870 PRINTTAB(A%-1,Y%-1)SPC(6)
880COLOUR1
890IF A$<>"-"PRINTTAB(A%-1,Y%-1)VAL(A$)
   ELSE PRINTTAB(A%-1,Y%-1)(A$)
900 B$=A$
910X$=GET$
920IF ASC(X$)=13 AND LEN(B$)=1 AND B$="-" GOTO940 ELSE IF
     ASC(X$)=13 PROCVALUE VAL(B$)):ENDPROC
930B$=B$+X$
940IF LEN(B$)>5 B$=LEFT$(B$,3)+RIGHT$(B$,1)
950PRINTTAB(A%-1,Y%-1)VAL(B$)
960GOTO 910
970**************************************

980DEFPROCVALUE(NO)
990ON JJ GOSUB1080,1100,1120,1140,1160,1180,1200,1220,
     1240,1260,1280,1050,1320 1340,1390,1370,1380,1390,
      1430,1400,1410,1420,1470,1430,1440,1050,1360,1460,
      1470 1480
1000ENDPROC
1010*************************************
1020 If you are..runing out of patience
1030 ommit the whole testing routine !
1040 DELETE lines 1090_1490 and 1500_1540
1050 also add   790 IF JJ>1 JJ=1
1060 and 990 GOSUB 1090
1070*************************************
1080IF FNOK(1,4,NO) PROCUPDATE(NO):RETURN
1090PROCWR(1,4):RETURN
1100IF FNOK(0,255,NO) E%(Z%+1)=NO:RETURN
1110PROCWR(0,255):RETURN
1120IF FNOK(-128,127,NO)E%(Z%+2)=NO:RETURN
1130PROCWR(-128,127):RETURN
1140IF FNOK(-128,127,NO)E%(Z%+3)=NO:RETURN
1150PROCWR(-128,127):RETURN
1160IF FNOK(-128,127,NO)E%(Z%+4)=NO:RETURN
1170PROCWR(-128,127):RETURN
1180IF FNOK(0,255,NO)E%(Z%+5)=NO:RETURN
1190PROCWR(0,255):RETURN
1200IF FNOK(0,255,NO)E%(Z%+6)=NO:RETURN
1210PROCWR(0,255):RETURN
1220IF FNOK(0,255,NO)E%(Z%+7)=NO:RETURN
1230PROCWR(0,255):RETURN
```

```
1240IF FNOK(-127,127,NO)EX(Z%+8)=NO:RETURN
1250PROCWR(-127,127):RETURN
1260IF FNOK(-127,127,NO)EX(Z%+9)=NO:RETURN
1270PROCWR(-127,127):RETURN
1280IF FNOK(-127,0,NO)EX(Z%+10)=NO:RETURN
1290PROCWR(-127,0):RETURN
1300IF FNOK(-127,0,NO)EX(Z%+11)=NO:RETURN
1310PROCWR(-127,0):RETURN
1320IF FNOK(0,126,NO)EX(Z%+12)=NO:RETURN
1330PROCWR(0,126):RETURN
1340IF FNOK(0,126,NO)EX(Z%+13)=NO:RETURN
1350PROCWR(0,126):RETURN
1360
1370IF FNOK(-15,16,NO)EX(16)=NO:RETURN ELSE
    PROCWR(-15,16):RETURN
1380IF FNOK(0,7,NO)EX(17)=NO:RETURN ELSE
    PROCWR(0,7):RETURN
1390IF FNOK(0,255,NO)EX(18)=NO:RETURN ELSE PROCWR
    (0,255):RETURN
1400IF FNOK(-15,16,NO)EX(20)=NO:RETURN ELSE PROCWR
    (-15,16):RETURN
1410IF FNOK(0,255,NO)EX(21)=NO:RETURN ELSE PROCWR
    (0,255):RETURN
1420IF FNOK(0,255,NO)EX(22)=NO:RETURN ELSE
    PROCWR(0,255):RETURN
1430IF FNOK(-15,16,NO)EX(24)=NO:RETURN ELSE PROCWR
    (-15,16):RETURN
1440IF FNOK(0,255,NO)EX(25)=NO:RETURN ELSE
    PROCWR(0,255):RETURN
1450IF FNOK(0,255,NO)EX(26)=NO:RETURN ELSE
    PROCWR(0,255):RETURN
1460IF FNOK(-15,16,NO)EX(28)=NO:RETURN ELSE
    PROCWR(-15,16):RETURN
1470IF FNOK(0,255,NO)EX(29)=NO:RETURN ELSE
    PROCWR(0,255):RETURN
1480IF FNOK(0,255,NO)EX(30)=NO:RETURN ELSE
    PROCWR(0,255):RETURN
1490ENDPROC
1500##################################
1510DEFPROCWR(L,LL)
1520IF JJ<15 AND JJ>30 EX(JJ+Z%-1)=TEMP ELSE EX(JJ)=TEMP
1530COLOUR3
1540PRINTTAB(10,10)"Allowed range: ";L;" to ";LL;
    PROCSPACE:PROCCLEAR:COLOUR1:PRINTTAB(A%-1,Y%-1)SPC4TAB
    (A%-1,Y%-1)EX(JJ+Z%-1)
1550ENDPROC

1560##################################
1570DEFPROCUPDATE(Z):X=Z:IF Z=1 Z=0:Z%=1 ELSE IF Z=2 Z=30:
    Z%=31 ELSE IF Z=3 Z=44:Z%=45 ELSE Z=58:Z%=59
1580EX(Z%)=X:COLOUR1
1590FOR F=0 TO 30 STEP6:PRINTTAB(F+1,4)SPC(8)TAB(F+1,6)SPC
    (8)TAB(F+1,4)EX((F+6)DIV6+Z)TAB(F+1,6)EX(6+(F+6)DIV6+Z)
1600NEXT
1610PRINTTAB(13,8)SPC(4)TAB(19,8)SPC(4)
1620PRINTTAB(13,8)EX(13+Z)TAB(19,8)EX(14+Z)
1630ENDPROC

1640##################################
1650DEFPROCUPDATE_SOUND:COLOUR1
1660FOR F=14 TO 32 STEP6:FOR G=12 TO 21 STEP3:PRINTTAB(F-1,
    G)SPC4;TAB(F-1,G)EX(16+(F-20)DIV 6+4*(G-12)DIV3):NEXT
1670ENDPROC

1680##################################
1690DEFPROCSPACE
1700PRINTTAB(8,25)"Please press space/bar"
1710 REPEAT T=GET:UNTILT=32
1720 PROCCLEAR
1730ENDPROC

1740##################################
1750DEFPROCSOUND
1760ENVELOPEEX(Z%),EX(Z%+1),EX(Z%+2),EX(Z%+3),EX(Z%+4),EX
    (Z%+5),EX(Z%+6),EX(Z%+7),EX(Z%+8),EX(Z%+9),EX(Z%+10),
    EX(Z%+11),EX(Z%+12),EX(Z%+13)

1770ENDPROC

1780##################################
```


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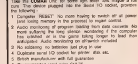
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Open Forum

Tank Attack

on Dragon 32

In this game for the Dragon 32 the object is to destroy as many tanks as possible in two and a half minutes. You have at your disposal a high-powered field-gun controlled by the cursor keys. The space bar is used to fire the gun at the tank crossing the battlefield.

Lines 210 and 700 can be deleted if your machine doesn't run the double-speed Pokes. The number of kills is indicated by crosses at the top of the screen, one for each tank destroyed.

(Note. — If you run in slow speed the time limit will obviously be longer.)

Program notes

30–200	Game instructions
210	Double speed poke
280–270	Set up screen
300–340	Draw and get tank
380–440	Draw background and gun position
490–810	Move tank
520–530	Display gun
540–570	Check cursor keys
580	Check space bar for hit
690	Update score at random first place of tank
710–810	End of game routine

```
10 REM      TANK ATTACK
20 REM MART(N.J.LLOYD (C) 1984
30 CLS0
40 PRINT@42,"tank";CHR$(128);"attack";
50 PRINT@98,"the";CHR$(128);"object";CHR$(128);"of";CHR$(128);"the";CHR$(128);"g
ame";CHR$(128);"is";CHR$(128);"to";
60 PRINT@130,"destroy";CHR$(128);"as";CHR$(128);"many";CHR$(128);"tanks";CHR$(12
8);"as";CHR$(128);"is";
70 PRINT@162,"possible";CHR$(128);"within";CHR$(128);"the";CHR$(128);"time";CHR$
(128);"of";
80 PRINT@194,"two";CHR$(128);"and";CHR$(128);"a";CHR$(128);"half";CHR$(128);"min
utes";
90 PRINT@258,"use";CHR$(128);"the";CHR$(128);"cursor";CHR$(128);"keys";CHR$(128)
;"to";CHR$(128);"move";
100 PRINT@290,"the";CHR$(128);"barrel";CHR$(128);"of";CHR$(128);"the";CHR$(128);
"fire";CHR$(128);"gun";
110 PRINT@322,"and";CHR$(128);"the";CHR$(128);"space";CHR$(128);"bar";CHR$(128);
"to";CHR$(128);"fire";CHR$(128);"e";
120 PRINT@358,"aim";CHR$(128);"at";CHR$(128);"the";CHR$(128);"tanks";
130 PRINT@418,"press";CHR$(128);"any";CHR$(128);"key";CHR$(128);"to";CHR$(128);"
start";CHR$(128);"game";
140 FOR C=1 TO 7
150 B=C
160 FOR A=0 TO 63:SET(A,0,B):SET(A,31,B):B=B+1:IF B>8 THEN B=1:NEXT A ELSE NEXT
A
170 FOR A=0 TO 31:SET(0,A,B):SET(63,A,B):B=B+1:IF A=8 THEN B=1:NEXT A ELSE NEXT
A
180 IF INKEY$="" THEN 190 ELSE GOTO 210
190 NEXT C
200 GOTO 140
210 POKE 65495,0
220 PMODE 3,1
230 SCREEN1,0
240 V=70
250 T=0
260 L=0
270 PCLS
280 DIM Z(60)
290 DIM Y(60)
300 DRAW"BM20,10;E2R3U3R4D1R5L8D2R2F3L1G8D3U1D1R3U1D1R3U1D1R3U1D1R4U2"
310 PAINT(23,9),2,4
320 GET(0,0)-(40,15),Z,G
330 PCLS
340 GET(0,0)-(40,15),Y,G
350 PCLS
360 CIRCLE(126,36),300
370 LINE(0,78)-(255,78),PSET
380 DRAW"BM0,78;E20F10E20F5E10F20E5F5E10F10E5F10E5F10F10E10F10E10"
390 PAINT(10,10),3,4
400 PAINT(129,57),2,4
410 DRAW"BM21,192;U20R47D20L"
420 PAINT(31,190),4,4
430 DRAW"BM153,192;U20R47D20L"
```

Microradio

GW6JJN

Computer games

With the Los Angeles Olympics fresh in our minds, it is interesting to look at the computer communications that were involved in providing information of all kinds to the press, contestants and to the audience.

The games were held close to Silicon Valley so it is not

Hi-tech

surprising that the hi-tech industries provided the most comprehensive data and information service ever seen at such an event.

The LA Olympic Authorities had an Electronic Messaging System (EMS) installed. Several companies contributed to this undertaking not least the American giant AT & T.

The Olympic games was held over 28 sports sites which, with various support facilities, covered about 5 000 square miles of Southern California. It was the function of EMS to link all this together and to provide certified results for each event, histories of athletes taking part, electronic

Instant results

mail and instant communication between terminals (nearly 200 of them) as well as providing facilities for meals, arranging buses, etc. The several thousand journalists covering the games were able to get instant results with such information as past medal holders past records for each event and biographies of players. This includes the television broadcasters who had access to the real time and elapsed-time' clocks used in timing events. So you don't need to have an encyclopaedic memory to be a journalist after all.

The EMS system allowed communication between terminals within the system, access to the outside world via the Pacific Bell telephone network and between the terminals and a central computer complex where the information is stored. This complex consisted of a dozen 32-bit machines each with 12 Megabytes of memory plus 9000 Megabytes on disc.

Communication through the system was by lines with a capacity of 56,000 bits per second, and not a modem in sight. If that seems fast communication between terminals and the main computer

Fibre-optic

complex was by fibre-optic cable at an incredible 90 million bits per second.

Along with all this was a back-up system capable of taking over the network and the lot had to run for a fortnight non-stop with the whole world watching.

The technology didn't end there, of course. The system had to be linked in real time to geostationary satellites transmitting data and pictures live into other computer networks and television systems all over the world. The achievement was certainly incredible — almost as exciting as the games themselves. Perhaps what we witnessed in Los Angeles was the ultimate in computer games.

Ray Berry GW6 JJN

This series of articles is designed for radio and microcomputer enthusiasts alike. If you have any queries that you want answered, hints and tips to share or topics that you would like to see covered write to Ray Berry, Microradio, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

```
630 PRINT[illegible]
650 DRAW"BM18,181C2[illegible]"
660 GOSUB 690
670 TIMER=0
680 E=100:F=110:[illegible]
690 PUT(A,B)-(C,D),[illegible],PSET
500 [illegible]
510 IF RND(2)=1 THEN [illegible] ELSE IF RND(2)=2 THEN [illegible]
520 LINE(E,J)-(F,J),PSET
530 LINE(G,J)-(H,J),PSET
540 IF PEEK(344)=223 THEN LINE(E,J)-(F,J),PRESET:LINE(G,J)-(H,J),PRESET:F=F+5:H=H+5
550 IF PEEK(343)=223 THEN LINE(E,J)-(F,J),PRESET:LINE(G,J)-(H,J),PRESET:F=F-5:H=H-5
560 IF PEEK(341)=223 THEN LINE(E,J)-(F,J),PRESET:LINE(G,J)-(H,J),PRESET:J=J-2
570 IF PEEK(342)=223 THEN LINE(E,J)-(F,J),PRESET:LINE(G,J)-(H,J),PRESET:J=J+2
580 IF [illegible] THEN PUT(A,B)-(C,D),Y,PSET:[illegible]:GOSUB 690
590 IF J<160 THEN J=J+2
600 IF J>180 THEN J=J-2
610 IF F<101 THEN F=F+5:H=H+5
620 IF F>1165 THEN F=F-5:H=H-5
630 IF PEEK(345)=223 THEN [illegible]
650 IF [illegible] THEN CIRCLE(H-F-10,N)[illegible]
650 IF V1=72 THEN [illegible]
660 IF TIMER>7317 THEN SOUND 210,5:FOR D=1 TO 50:NEXT D:SOUND 210,5:DRAW"[illegible]":FOR D=1 TO 2500:NEXT D:GOTO 700
670 GOTO 650
680 PLAY"[illegible]"
690 A=0:B=[illegible]:IF B<72 OR B>140 [illegible] THEN [illegible] ELSE [illegible]:IF [illegible] THEN CIRCLE(V,T),3,2:IF V>=245 THEN T=T+6:V=70:RETURN ELSE RETURN ELSE RETURN
700 POKE 65494,0
710 A$="":[illegible]=INKEY$
720 CLS0:PRINT@[illegible],"number";CHR$(128);"of";CHR$(128);"tanks";CHR$(128);"destroyed";CHR$(128);"in";CHR$(128);:PRINT@[illegible],"two";CHR$(128);"and";CHR$(128);"a";CHR$(128);"half";CHR$(128);"minutes"
730 PRINT@[illegible]
740 FOR D=1 TO 2500:NEXT D
750 CLS0
760 PRINT@[illegible],"press";CHR$(128);"any";CHR$(128);"key";CHR$(128);"to";CHR$(128);"play";CHR$(128);"again"
770 FOR D=1 TO 100:NEXT D
780 PRINT@[illegible],"PRESS ANY KEY TO PLAY AGAIN"
790 FOR D=1 TO 100:NEXT D
800 IF INKEY$="" THEN 810 ELSE RUN
810 GOTO 780
```

Tenk Attack
by Martin J Lloyd

Colour utility

on Vic20

This program is for the unexpanded machine. It enables the user to try out different coloured screens without working out the value to be *Poke*d into 36879. Run the program, and using the number given in the *Rem* statements, answer the questions and the Vic will give you your screen combination.

Program notes

Line 10-30: Get number of border colour
Line 40 Input screen colour number
Line 50 Colour screen appropriately
Line100+ Numbers for the colours

```
10 PRINT"[illegible]BORDER COLOUR
   [illegible]
20 [illegible]
30 [illegible]-1
40 INPUT"[illegible]SCREEN COLOUR
   [illegible]-1
50 POKE[illegible]
100 REM BLACK       1
110 REM WHITE       2
120 REM RED         3
130 REM CYAN        4
140 REM PURPLE      5
150 REM GREEN       6
160 REM BLUE        7
170 REM YELLOW      8
180 REM ORANGE      9
190 REM LT ORANGE  10
200 REM PINK       11
210 REM LT CYAN    12
220 REM LT PURPLE  13
230 REM LT GREEN   14
240 REM LT BLUE    15
250 REM LT YELLOW  16
```

Arcade Avenue

Hacker's dream

Jet Set Willy is becoming not only the favourite of games players but also a computer hacker's dream.

I can't begin to count the number of 'extra lives' programs that arrive in the mail.

Another program I received is designed to change the titles of the various screens. We have published one such listing for *JSW* and I would like to know from readers whether you want the same for *Manic Miner* — if so the first listing, already received — will be printed. I also get a lot of routines that overcome the colour-code loading sequence but with the current sensitivity about piracy I don't intend to encourage people in print to overcome this protection device. For those who have genuinly lost their colour card or are colour blind first write to Software Projects and if they don't offer any help then perhaps we'll think again.

Anyway, thanks in the meantime to Christopher Kenworthy of Preston, TJ Vernon of Reading, Andy Beatie of Radstock, Robert Lewis of Richmond, NJ Fuller of Eastbourne, Jerry Brown of Ponteland, R Ley of Plymouth and Simon Dales of Poole.

David Hookham of Barwell says that Willy can be sent to many rooms in the mansion by loading the game, typing *Writetyper* and pressing 9 plus a combination of keys 1-8. You must be careful where to position Willy so as not to end up somewhere lethal. Start from the left of the stairs on the landing. This is one way to get to the objects beneath the conservatory roof!

P Oakey and P Collins offer *Poke* 38488,40 which turns Willy into a flying pig in most rooms.

Michael Poyner of Tewkesbury warns against loading the game with Interface I connected because the game freezes. This is not a bug — it is due to the large size of the program.

Kevin Young of Dundee offers these tips — clear the priest's hole first because it is the hardest screen, there is an invisible object in the hall on the top level and an object is added to your score when you pass left into the swimming pool. He has finished the game by collecting 83 objects at 8.47am after removing the bug that prevents access to the right of A Bit of a Tree. We published the necessary *Pokes* a few weeks ago. Robert Lewis says that this screen is best completed by going to the Banyan Tree then "get on the hump one from the furthest from the left and jump right, then jump and go up".

Finally on this subject — congratulations to Helen Gray, aged $10^{2}/_{3}$rds, from Upminster for finding 59 of the rooms. I would love to see a copy of your map. (There is only one room left to find.)

I promised to say how I got on with *Manic Designer* — well this is a very useful utility for recreating the positions of the conveyor belts, crumbling platforms etc, on *Manic Miner*. Although easy to use it is slow and hard work producing screens that are challenging as well as being possible to complete. My sympathies go out to Matthew Smith — *Manic Miner's* author — who must have put a great deal of effort into the original to produce screens that are very playable.

Tony Kendle

The Arcade Corner is a new section for anyone who enjoys playing arcade games. If you have any comments, from playing tips on difficult games or programs you'd particularly like to praise (or blame!) then write to Tony Kendle, Arcade Avenue, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

Open Forum

Clear Screen

on ZX Spectrum

This machine-code routine is designed to aid ZX Spectrum users by cutting out the *CLS* command needed for universal colouring. To use the routine you must:

1) *Poke* your specified attributes into 32807 (Refer to page 116 of the manual.)

2) Call the machine code by using the command *Let 1 Usr k.*

This program works by finding the start of the attribute file then fills in the corresponding square with your number.

An important note is that the program should not be *Newed* as it is not held in an area unaffected by the command.

```
9000 LET k=PEEK 23730+256*PEEK 2
3731
9010 FOR g=k TO k+17: READ a: PO
KE g,a: NEXT g
9020 DATA 33,0,88,6,3,62,0,54,40
,35,81,32,250,120,5,32,243,201
9030 STOP
```

Clear Screen
by David Parkinson

Memory

on BBC

This short program for any BBC will display the memory contents between two specified addresses. Unlike some similar programs this one displays 32 characters per line as well as the address — making it easier to see errors. Addresses can be entered in decimal or in hex form (if in hex precede with '&')

```
>LIST
   10 REM     M A Colson  22 3 1984
   20 MODE 7
   30 ON ERROR GOTO 250
   40 INPUT "Start Address ? "S$
   50 S%=EVAL(S$)
   60 INPUT "End Address ? "E$
   70 E%=EVAL(E$)
   80 FOR A%=S% TO E% STEP 32
   90 VDU 129
  100 IF A%<&1000 PRINT ;"0";
  110 IF A%<&100 PRINT ;"0";
  120 IF A%<&10 PRINT ;"0";
  130 PRINT ~A%;"  ";CHR$(131);
  140 FOR B%=0 TO 31
  150 C%=A%?B%
  160 C$=CHR$(C%)
  170 IF C%<32 OR C%>126 PRINT ".";
  180 IF C%>31 AND C%<127 PRINT C$;
  190 NEXT
  200 PRINT
  210 NEXT
  220 PRINT
  230 GOTO 40
  240
  250 IF ERR=17 RUN
  260 REPORT:PRINT
     " at line ";ERL
```

Memory
by M A Colson

Strobe

on ZX81

This is a simple short sub-routine which could be included in a utility or educational program. It could also be used as a bit of fun in a darkened room. It uses the fast and slow speed modes of the ZX81 to simulate a stroboscope.

You can change the flash rate by inputting a number at the start.

Program notes
10–30 Frequency
80–130 Stop start screen.

```
  5 REM STROBE (c) S.A.WEIR Jan 84
 10 PRINT "INPUT FREQUENCY"
 20 INPUT A
 30 PRINT A
 40 FOR D=1 TO 200
 50 NEXT D
 60 PRINT
 70 PRINT "**HOPE YOURE
 80 FAST
 90 PAUSE 240
100 FOR F=1 TO 100000
110 PAUSE (100)/(A*1000)
120 PRINT F
130 SLOW
140 SCROLL
150 FAST
160 NEXT F
```

Strobe
by S A Weir

Baud Walk

Telesoftware

There are a number of developments taking place in the software industry that could point to much more software being available electronically — and that's where data communications and the humble modem step in.

Scenario 1 You are reading a magazine at 10pm at night and a particular software product catches your eye. Instead of the advertisement directing you to a shop it directs you to a telephone number. Hook up your modem, and with a few keystrokes you are able to down-load the program into your micro and run it. The system automatically debits either your charge card or telephone account.

Scenario 2 You are reading the same magazine which contains an exhaustive listing of a handy utility. Instead of spending hours typing in the listing — only to find you've made a keyboard error — you simply ring up the magazine's own bulletin board or database services and down-load the software.

It was this vision of the future of software which originally sparked off the concept of Micronet 800, the telesoft service on UK Prestel and which this year, has seen the announcement of Compunet by Commodore.

I will cover telesoftware in a later column, but essentially it is simply a file transfer protocol which enables data to be transmitted along the telephone lines to a microcomputer with error correction built in. The receiving micro has specially designed terminal software which unpacks the data (which may be encrypted for piracy protection) and loads it into the micro's Ram or offers the Save option. Telesoftware programs, usually public domain offerings, abound on bulletin boards in the UK which also allow users to up-load back to the board, hence the predominance of 300/300 baud ports instead of the 1200/75 working.

Micronet 800 currently offers programs for down-loading from a number of leading companies for the Spectrum and BBC micro computers (although there are some notable exceptions) and Commodore I am sure will support Compunet both with its own software and by encouraging other houses to provide programs.

Whether telesoftware ever takes off as a true commercial proposition is still difficult to estimate — however the more modems there are in circulation the more attractive your favourite software house is going to find the prospect.

Why not write and tell me what you think of the software available so far on Micronet.

Robin Wilkinson

Baud Walk is a new weekly column with news on networking, data bases, reviews of modems and software and points of contact for information.

Any readers with experience of networking are asked to send their experiences or news of services to Robin Wilkinson, Baud Walk, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 3LD.

He can also be contacted on Prestel mailbox 418083727



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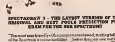
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Tony Bridge's Adventure Corner

Kick the telly

A couple of weeks ago, I mentioned *The Curse of the Seven Faces*, a new adventure from Classic Computing. If your appetite was whetted by my description of it, you will be pleased to know that the program will shortly be released by Artic and will be in the shops soon. Co-author Alan McDonald is now converting the adventure to run on the Enterprise, as well as working on Amstrad adventures. If you Amstrad owners want to write to him with ideas, you'll find his address in the *Corner* of July 19.

The Grand Elf was obviously stuck fo a dungeon that week, having lost the address of John Copland, the author of an excellent adventure, *Treasure of Meathos*. For your copy, write to him at 70 green Lane, Dronfield Sheffield S18 6LN.

Now for some help first, for Wayne Coleman, who has finished *Mountains of Ket*, the first of the Ket trilogy from Incantive Software. It certainly is advantageous to score 100% in that program, Wayne, and I hope you kept a note of that code word — *do* the same with the next two parts, and you are in first for a video recorder that being the prize for completing the trilogy!

Speaking of Artic, as we were, the early adventures from this company are still causing problems for people like Mr W Gibbons, who is playing *Espionage Island*. To get past the tank, Mr Gibbons refer to the list of words at the end of the corner, and 10,10,3,24,16,29,8 31,24, and then 10,10,7,32. 31,9 Tony Coxon can't see into the dark corner — actually, Tony, you don't really need to see into the corner, but 26 8 and then 26,12 To get downstream just 14! Karl Bennet and Rupert Woodman are stumped by the crevasse. To get over, fellas, 25,4, and to get across the Swamp, look at the clue — doesn't it say something about SEWiNg?

Ship of Doom was always a mystery to me — I could never melt the ice over the woman, or smash the glass covering the key (or was it the other way round. ?) — but despite all that, or maybe because of it, it was (is still, I should say) an addictive and aggravating adventure. Several players are trying to unlock the door; just 29,22.. 31,9 Incidentally, for those of you just starting on that game, the way to power up the sonic screwdrive is to 29,39,31,40.

Planet of Death was the very first Artic adventure — I remember buying it for my ZX81 at the second ZX MicroFair way back in (I think) 1981. It kept me up late for months afterwards and, judging by the letters I've had, it still holds its power over Spectrum owners. To get the rope from the tree, 13,19. 41,17 For those who, like Gavin Barry, are wondering what to do with the buttons on the lift, try this: 42,30,18,1.

Many people are having trouble with the force-field in the cavern — it can be rather a sticky problem (it's meant to be, after all!). The accepted way through is to (37 20) × 2, and then 37. If you land up in jail, just kick the bars to escape. There are several red herrings in this adventure, one of which is the gold coin, to be found in the lake. Although you can indeed bribe the guard with this, in order to escape the jail, it is not necessary, and in fact will not help you solve the adventure. After escaping the jail, 38,21 — which will return you to the cavern. The mirror is not a red herring, as it will be needed to reflect the force-field. Incidentally, although the maze in *Planet of Death* was the first one of its kind I had come across, it is actually pretty easily solved — just go through the cardinal points of the compass to escape and find the ice cavern.

And now to *Golden Apple*, the last of the first series of Artic adventures. I haven't had so many questions about this one (has it sold as well as the others?), but to get you started, you will need to smell the flowers at the start in order to find the keys. Several adventurers have wondered what use the parrot is at a later stage of the game — as far as I know nothing can be done with it, but it will tell you something useful, that can be used at the computer (28 or not 28). Where my memory has slipped here, I'm indebted to Ron Smith for excellent maps and hints.

Finally, a telling-off from Pete Ashmore of Gosport. He writes: "You have a lot to answer for! Here I am, a 57 year-old professional idiot, who bought a ZX81 to 'try my hand'. This was in February 1983, at the same time as I began reading *PCW*. I fitted a DK'tronics keyboard — very good — put the power unit and 16K Rampack inside, and fitted a bigger heat-sink. Everything is working fine, but then I made my biggest mistake, which was start reading articles by that 'swine' Tony Bridge. I thought, 'I wouldn't mind trying one of these adventures' and bought *Pimania*. It's entirely your fault that I have changed from a calm peaceful man into a raving maniac, ready to kick the telly, stamp on the ZX and turn to drink [*no problem there, Pete, I do it every Saturday night!*]"

Many people have written to me about *Pimania*, though none so eloquently as Pete Ashmore — the lure of the golden sundial (the deadline for which, I believe, has just passed again for this year) has meant that the adventure has been bought by many but obviously not solved by a single person, as yet.

Pete is having trouble getting through the green door. It's difficult to tell you exactly what to do here, as everything depends so much on what you have with you — suffice to say, that only certain combinations of objects will work, and I'm afraid that it is up to you to experiment. To give you a start, though, try taking the telescope and the deaf aid (you'll get both of these gifts from the Pi-Man after giving him some food, and this also requires a certain combination to be used, so it is going to take a lot of trial-and-error). I hope to return to this crazy adventure.

Code words. 1 ONE, 2 ROCK, 3 REMOVE, 4 STICK, 5 PLASTIC, 6 THE, 7 SHINE, 8 CORNER, 9 HOLE, 10 SWITCH, 1 LOCK, 12 STRING, 13 GET, 14 FLOAT; 15 TWO; 16 AND 17 ROPE, 18 USE, 19 FLINT, 20 LASER, 21 UP, 22 KEY, 23 WITH, 24 LIGHT, 25 DROP; 26 FEEL, 27 DANCE, 28 PULL, 29 INSERT, 30 THREE, 31 INTO, 32 TORCH, 33 HERING, 34 TAKE, 35 YOU, 36 BREAK, 37 FIRE, 38 GO, 39 BATTERY, 40 ROD; 41 CUT; 42 PRESS,

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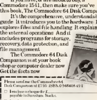
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This series of articles is designed for novice and experienced Adventurers alike. Each week Tony Bridge will be looking at different Adventures and advising you on some of the problems and pitfalls you can expect to encounter. So, if you have an Adventure you want reviewed or if you are stuck in an Adventure and cannot progress any further write to Tony Bridge, Adventure Corner, *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2R 3LD.

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Light pen

Jason Birch of Rochdale, Lancs writes:

Q **I own a Vic 20 and I am thinking of buying a light pen. There are two kinds of light pen, normal ones and ones that use pixel pads. Please could you tell me a) which type you recommend? b) how much would one cost? and c) what can I use it for?**

A It's funny, but light pens seem to be the latest thing at the moment yet I can remember programming an IBM mainframe computer to accept a light pen generated input back in 1971.

I suggest you go for a standard light pen, such as the one from Stack. It costs £25 and is fully compatible with the Vic.

With a light pen you can write programs that allow words and images to be moved about the screen, or trigger off a series of actions by touching a keyword on the screen with the pen. A small number of light-pen compatible software packages and games are also available, some produced by Stack.

New angle

Cpl J Weaver of RAF Gutersloh, BFPO 47 writes:

Q **Is there a way of emulating the BBC's command *Old* on the Spectrum, so that a previously *Newed* program can be retrieved? Also, can you explain how to fit a reset switch on a Spectrum so that the dreaded never-ending loop can be exited from without losing the program.**

A The Spectrum *New* command clears memory from address 3FFF (hex) up to Ramtop. This means that any Basic statements held in the machine are lost for ever. Machine-code routines, as they reside above Ramtop are unaffected, as are UDG's.

You can see that for Basic programs there is no way of *Olding* them once *New* has been executed.

There are number of ways of fitting a reset switch to a Spectrum, the easiest of which is to wire the power supply into a light switch (for example, from a table lamp) and wire the switch into the Spectrum power socket. However there are reset switches available on the market at the moment, and one which I find personally very attractive is a component of the new joystick interface from AGF (the Protocol 4 interface).

Business

Aaron Byers of Lenzie, Glasgow writes:

Q **I am a keen games player (I have a Vic) and am hoping to introduce my dad to business software (on a small scale). Could you please advise me on which computer would best suit my needs from the following: MSX, Plus/4 and Amstrad.**

A It seems to me that you are looking for a dual-purpose machine — games and business. To achieve this you will need a machine with a capability for disc handling, and good printer controls. All three types of machine you mention would be able of providing your father with the business software that he would probably require. As yet neither the Plus/4 or MSX machines are available in the shops and certainly to begin with neither will have the variety of games that you might want. On the other hand the Amstrad may soon have a large amount of games software on it — but so far there is no disc unit on sale.

If I had to pick one, I would probably pick the Amstrad but I would want to see if the disc drive and CP/M software is launched in the Autumn.

No point

L Privett of Ilford, Essex writes:

Q **Please could you tell me if there is an equivalent Spectrum *Peek* instruction to the *Point* command, as a program I am writing will not compile into machine code. The *Point* command is not accepted by the compiler, but the *Peek* command is.**

A Unfortunately not. The Spectrum's screen display is laid out in memory in such a way as to make that extremely difficult.

You will need to convert the *X* and *Y* pixel co-ordinates into screen display file addresses, and then test for the bit you want.

As you can imagine this is quite a complex business. I don't know whether your compiler allows machine-code routines to be called, but if it does what you have to do is to put the *X* and *Y* pixel co-ordinates on to the calculator stack (*Y* co-ordinate on top) and then call the *Point* subroutine at Rom address 22CB'H. If the pixel is on, a 1 will be on top of the calculator stack; a 0 will be there if it is off.

Video, video

S Keating of Leyton writes:

Q **I have a Sinclair Spectrum and I found how to record my programs on a VCR. However, I've only done this once as I'm not sure if it might damage either my computer or my recorder. Do the output signals from the Spectrum cause damage to the video? Or vice-versa? Or not at all?**

A There is nothing wrong with using a VCR to record computer programs. No adverse effects will be produced on either the computer or the video by using them in this way.

The only problem you might get is if you are doing a lot of rewinding, such as when you *Save/Verify*. This could cause minor problems with the fast rewind mechanism on the VCR. However this is a remote possibility only.

Break dance

Ian Brennan of London writes:

Q **I am writing a Basic program on the Spectrum, which also has a machine-code routine for printing large letters. My problem is security. I can't stop my program from being broken into, except for *Poke* 23613,0, which redirects the error return, causing a crash if *Break* is attempted. As crashing the program every time is not the ideal solution, I was wondering if you could help me.**

A You have the answer to your problem at your fingertips. What you should do is place a *Return* instruction (machine code) at the end of your machine-code routine, and make the *Err Sp* system variable point to its address. This will have the effect of ignoring *Break*.

CBM calling

A Murray of Manchester writes:

Q **I own a Commodore 64 and I have heard of modems for the Spectrum, BBC etc. Could you tell me if there are any modems for my machine?**

A There are indeed a number of modems available for the CBM 64. All would be too many to mention here, but I'll list just a few: Tandata TM110, OEL Telemod 2 and OCS Interpod — all of which costs around £100.

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Phil Rogers and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke*, *PCW*, 12-13 Little Newport Street, London WC2R 3LD



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FOR SALE. ZX Spectrum Digital Tracer Boxed as new Used 4 times £36 L. Cawley 2 Dorset Rd Gorton Manchester M18 7PA.

CENTRONICS 737 printer 80 Column dot-matrix graphics underline superscript etc parallel interface selling due to incompatability with new machine 01 683 0963 evenings £200

FOR SALE 40 ch CB + S W R and aerial + Coax or swap for Fuller keyboard D K Tronics considered also would like to buy Splatt for Spectrum for details Phone 453 5807 (021)

8 INCH DISC DRIVES Pair of D RI DS DD 1mb each No power supply or controller hence £250 each Tel 01-683 0963 evenings Shugart compatible

ACE TELCOM viewdata decoder Prestel Special Modem offers around £100 Tel 01-683 0963 evenings

SHARP MZ 700, data recorder various s/w inc over 20 games (original) £165 Or swap with CBM 64 Tel Scunthorpe 866124

TI99/4A WITH CASSETTE cable perfect cartridge as new £50 TI expansion box unused bargain £85 Tandy CGP 115 Printer/Plotter with paper only £90 Tel 021-352 0385 eves.

LYNX 48K + extras £100 Tel Belper 4040 (Derbyshire)

TANGERINE MICRON 16K CMOS RAM 10K basic Xbug assembler disassembler toolkit various software including Adventure Space Invaders Labrinth etc £40 the lot Tel 0793 813250

Wanted

SWAP Quickshot joystick plus interface plus Currah micro speech plus software originals, Valhalla H U R G 3D Lunattack and Blade Alley for Prism VTX5000 modem and manual etc. Tel Coalbridge 35685 evenings.

SWAP Texas personc module for Adventure one Pirate or Statistics cartridge Write to J C Crees 106 Tollgate Drive Stanway Colchester CO3 5PR

WILL pay up to £150 for working BBC B or £50 for broken BBC Also wanted CBM 1541 disk drive and any printer for Commodore 64 Tel (01) 887591 Ireland

SWAP ZX Spectrum 48K with joystick and interface with software (Spectrum still under guarantee) for Commodore 64 with or without software Must be under guarantee Tel Douglas on 01 907 1204

WANTED Monitor or autostart ROM and graphics ROM for Apple II and /or graphics ROM Hex dump Eprom copies OK with circuit mods B P Smith 6 Mead Lane Farnham Surrey GN9 7DY

SWAP 48K Spectrum (under guarantee) with leads manuals amplifiers tons of mags books, etc for Commodore 64 (with or without software) Quick swap needed Tel Birmingham 021 3578452 after 5pm

DURST colour enlarger 605 + accessories worth £605 swap for computer Any considered Tel 903 3178

SWAP portless Sanyo stereo music centre for Interface I or D M Tronics keyboard Tel 01 593 6288 after 4pm

SWAP 88 computer mags 60 PC news 6 PCW 4 PCN 18 SU For 1K ZX80 Tel F Blackpool (0253) 724688 (will collect in Lancs area)

SWAP Currag microspeech 10 month guarantee for ZX printer + paper Tel 0472 802445

TEXAS 99 4a wanted logo2 twriter typing tutor multiplan peripheral expansion box, cards editor assembler mini-memory speech synthesis extended basic Pascal Forth Donkey Kong Tel 021-742 1969

ADVENTURE HELPLINE

Espionage Island on Spectrum. Help me to get across the sinking swamp John Cowley, 43 Chynace Drive, Newquay, Cornwall TR7 2AA.

The Count on Vic20. How do I enter the dark window under the bedroom, and get out of the dark pit in the dungeon? Stephen Potter 27 Stratford Road, Breadsall, Derby

Fantasia Diamond on Spectrum. I cannot progress having reached the river which I can not cross Rupert Drummond-Hay, The Old Hall, New Road, Burton Lasars, Melton Mowbray, Leics

Pharaoh's Tomb on Spectrum. How do you get into the tunnel which is in the ice room? Mr J Gillingham, 152 Newman Road, Exeter Devon.

Mountains of Ket on Spectrum How do I get past the skull in the south? John Douglas, 245 Stewart Royd, Commercial St, Heckmondwike, W Yorks.

Colossal Adventure on Atari 800.

I cannot get past the maze just after the crystal bridge Neil Penney, 15 Chilterns Hill Road, Beaconsfield, Bucks

Quest for the Holy Grail on Spectrum How do I get the pin out of the Holy Grenade? Alan Vaughan, 88 Cranwell Road, Liverpool.

Twin Kingdom Valley on Electron. How do I get past the witch in the desert king's castle? James Morris, 53 Gays Road, Bristol.

Arrow of Death part 1 on Commodore 64. 1) How do I get the arrowhead from the serpent? 2) How do I get the ladder from the giant building? 3) What are the tree stumps and the cauldron for? Paul Duxbury Walford, Basingstoke Rd Spencers Wood, Reading, Berks

Snow ball on Spectrum. How do your reach the trapdoor after getting out of the coffin, and how do you kill the nightingale? Jason Hutchinson, 6A Mill Hill Avenue, Pontefract, West Yorks.

Planet of Death on Spectrum. How do I get out of the prison cells and how do I operate the lift? Simon Timmons, 311 Blackpool Road Carleton, Poulton-le-Fylde, Lancs.

The Hobbit on Spectrum. When I get to Laketown with the treasure I cannot get Bard to shoot the dragon. Darren Adlington, 475 Whippendell Rd Watford, Herts

The Knights Quest on Spectrum. How do you go east — from inside the cleft or up the rocky mountain? Gareth Blayney, 47 Allt-yr-yn Ave, Newport Gwent

Diary

Event	Dates	Venue	Admission	Organisers
2nd Official Acorn User Exhibition	Aug 16 (trade day) Aug 16-18 10.00am-6.00pm Aug 19 10.00am-5.00pm	Olympia 2 Hammersmith Rd. London W14	£2.00 adults £1.00 children (on door)	Small Enterprises 01-930 1612
Electron and BBC Micro User Show	Aug 31-Sept 1 10.00am-6.00pm Sept 2 10.00am-4.00pm	UMIST Manchester	£2.00 adults £1.00 children	Database Publications 061 456 8383
Games Day 84	Sept 1 10.30am-6.00pm Sept 2 10.00am-5.00pm	Royal Horticultural Society's New Hall Greycoat St, London SW1	£1.50	Games Workshop 01 960 3713
Hampshire Computer Fair	Sept 6 11.00am-6.00pm Sept 7 10.00am-5.00pm	Guildhall, Southampton	Trade – free Public £2.00	Tantwood Exhibitions 0703 [illegible]
Walthamsoft 84	Sept 8 10.00am-6.00pm	Main Exhibition Hall, Waltham Forest Technical College, Forest Rd, London E17	£1.00	London Exhibitions and Promotions 01-[illegible]
ZX Microfair	Sept 1 10.00am-6.00pm	Alexandra Palace, London N22	£1.00 adults 50p children (on admission)	ZX Microfairs 01-801 9172
Personal Computer World Show	Sept 19-22 10.00am-7.00pm Sept 23 10.00am-5pm	Olympia 2, Hammersmith Rd, London W8	£3.00	Montbuild Ltd 01-486 1951

New Releases

Elvish

Setting up a Spectrum-orientated games software house and releasing new material now in the height of the hot slow summer is to open the throttle right out and dive your Zero of private enterprise kamikaze-style straight in to the flight deck of the aircraft-carrier of capitalism. Or something like that.

Nevertheless, Gamma software have done just this.

Of its three recently released programs I looked at *Orc Slayer*, an adventure in the classic tradition. By this I mean that you have to visit over 120 locations looking for a magic runesword with which to kill a baddie who has killed your family. This involves visiting a lot of places with funny names like Azonti and the Maze of Desperation (we've got a Neil Armstrong Way near where I live). In any event I'm sure it contains enough *Lord of the Rings* rip-offs to keep adventure fans scurrying about and chattering in elvish about swords of power for ages.

It isn't fair to review adventures when you've had only a few minutes to look at them, so I'll say that the puzzles and places I came across were more intriguing than most other text adventures I've seen recently.

Program	*Orc Slayer*
Price	*£5.95*
Micro	*Spectrum*
Supplier	*Gamma Software* *12 Milverton Road* *London NW6 7AS*

Near Miss

Alcatraz Harry is the first Spectrum game from Mastertronic after its recent claims that the new games at £1.99 were going to be as good as anything usually put out at £5.95.

Making claims like that is rather like tying yourself to the rails and asking critics to drive their train over you. Mastertronic want *Alcatraz Harry* to be great value at full price, with no excuses. Is it? I think it's probably a near miss — not quite good enough to beat the full price games completely out of sight (although I've certainly seen far worse games put out by large companies for five or six pounds) but excellent value at £1.99.

Although the game is described as 'a unique blend of arcade, strategy and adventure, in point of fact it is primarily a memory game with strategy overtones. The idea is to escape from a prison camp. This involves three stages — getting the equipment, negotiating a mine field and stealing a car.

The camp is presented graphically in a sort of simple hi res 3D, and you move your little sprite type person (which walks as though completely drunk) over a number of screens looking for the equipment. To begin with you are shown a layout of the camp and are told where the secret files are located and you must remember these, as well as other details discovered as you look around the screen, to avoid being captured.

Pick of the week

Off the rails

One of the cleverest and graphically most impressive games I've yet seen for the Commodore 64 is *Loco* from Alligata. The idea is to move a beautifully animated steam train along the track switching lines to dodge bombs, explosive handcarts, airships and planes whilst collecting flags and trying to make it to the next level.

Your defenses include lethal smoke from the funnel (all that carbon monoxide I'd guess) and an in-built radio scanner that tells you what's coming down the rails at you with just enough time (hopefully) to switch tracks and avoid the obstacles.

It has the now almost mandatory three-voice continuous soundtrack — on this occasion it's a medley of Jean Michael Jarré bits and pieces (hope you've okayed this one, Alligata) described as 'toe tapping' on the box. I haven't heard music described as 'toe tapping' for years. Next they'll be describing it as 'groovy' or 'really swinging'.

Actually *Loco* is a superb game, simple, ingenious, with wonderful graphics. It deserves to sell in vast quantities. One of the musts on the C64 for this year I think.

Program	*Loco*
Price	*£7.95*
Micro	*Commodore 64*
Supplier	*Alligata* *1 Orange Street* *Sheffield S14 DW*

Later sections have you reasoning out where mines are located from a simple colour code — the graphics are quite nice although simple and the game itself has a straightforward appeal.

It's really this simplicity that would make me wonder about it's chances if it was sold for £5.95.

Nevertheless if you have £1.99 to spare next time you're in Tesco or Asda or countless other retail chains (impulse buying you see) you should grab this one.

Program	*Alcatraz Harry*
Price	*£1.99*
Micro	*Spectrum*
Supplier	*Mastertronic* *48 George Street* *London W1*

Business style

Despite all the troubles, there are still companies supporting the Dragon 32.

After all, whatever its faults, the Dragon is perfectly capable of running business-style software where high speed graphics are not important.

One such program is *Instant Graph Plotter* from R&P International. As the name suggests it is a sophisticated graph plotting program capable of drawing several graphs at once and accommodating a range of scales.

Data can be entered directly or mathematically manipulated using function keys for logarithmic, exponential or square function growth and decay. The manual includes extensive notes on altering the program (it's in Basic) to suit your own particular needs. Better still, the manufacturers will endevour to explain how to change the program to your exact requirements if you write to them directly — sounds like an offer you can't refuse.

Program	*Instant Graph Plotter*
Price	*£7.80*
Micro	*Dragon 32*
Supplier	*R&P International* *PO Box 189* *Wembley* *Middlesex HA0 3UG*

No comet

Watch the skies With Halley's Comet rushing through the universe towards us the least we can do is give it the courtesy of looking at it, especially since if you miss it you are going to have to wait 76 years for another one to come round.

Should you decide to give it a peek, all the information you could possibly want in order to find it, as well as a heap of background material can be found on *Halley's Comet* by Eclipse Software See the comet plotted on a starmap or pictured on local skylines, all in hi-res Spectrum graphics or get a plot of the 76 year orbit

There are various other screens of information, all visually appealing I agree with Eclipse when they say that you don't have to be and astronomer to find the program interesting

Program *Halley's Comet*
Price *£7.45*
Micro *Spectrum*
Supplier *Eclipse Software*
79 Ardrossan Gdns
Worcester Park
Surrey, England

Taking stock

A lot of people doubt that its possible to use a home computer for serious business purposes — especially a Spectrum with its rubber keyboard

Nevertheless companies still continue to produce such programs More recently facilities like the ZX Microdrive and RS232 for printer connection make business a slightly more serious proposition than it was — providing your requirements are not very great.

Simple Business Accounts is seriously intended for use by small businesses and is intended to provide a simple cash book for records of cash in hand, cheques, bank balance etc.

Receipts and expenditure can be organised under 30 headings and information can be protected by a password and either saved or sent to a printer Flowchart say the program is simple to use and certainly it lacks the vast manuals of similar programs — this one has only eight pages

Program *Simple Business Accounts*
Price *£11.95*
Micro *Spectrum*
Supplier *Flowchart*
82 High Street
Irthlinborough
Northamptonshire
NN9 5TN

Our urn

Maybe it's the slow summer or just a fluke but all the recent releases from the traditionally wargames house Lothlorien have instead been arcade style titles (well, nearly all)

Spooky Mansion is a multiscreen arcade game for the Oric and Atmos. Aside from anything else it has the great virtue of being reliably recorded for a Fast Load, which means that whilst waiting for it to appear you only have time, say, to sip one cup of tea instead of drink an entire urn full.

The bad point about the game is that the name of the character you represent is Hu go First. (A word to software houses here just because your 12 year old programmer is a computing genius it doesn't mean you should let him/her write the cassette blurb Take your lead from that redoubtable moral philosopher, Avoyd Anlecoste.

Back to the game There are seven screens, each with a different set of challenges of the 'collect things without anything bashing, bumping, biting, leaping or jumping on you' kind. You must climb, jump and swing with the best of them to the final confrontation with Count Dracula.

It's all in machine-code and Lothorlen think that it may have the most number of screens of any Atmos game.

Program *Spooky Mansion*
Price *£6.95*
Micro *Atmos/Oric*
Supplier *MC Lothlorien*
56A Park Lane
Poynton
Cheshire SK12 1RE

Starter for 20

Amazing as it may seem someone somewhere out there has just bought a Vic20 starter pack. Commodore are, I suspect, as amazed as I am that the Vic20 refuses to be killed off. These new owners must be looking for new software releases and Commodore have obliged. It is continuing to issue new programs for the Vic and the most interesting of the current batch is *Bomber Mission*, a sort of flight simulation program which requires 16K.

Though the controls have been kept fairly simple the game certainly is not — even if you manage to bomb the enemy target you still have to return and manage to land before your time runs out. The graphics are about as good as you could reasonably expect from the Vic and so if you have the machine you'll probably want this game

Program *Bomber Mission*
Price *£4.99*
Micro *Vic20*
Supplier *Commodore*
1 Hunters Road
Weldon North
Industrial Estate
Corby
Northants NN17 1QX

Customised

Random Access Mailing is a useful-looking program, particularly for those using *Wordwise* for serious business word processing

The program enables you to use existing files and insert a different name and address from a series kept on another file. Customised mailshots — just like with real computers!

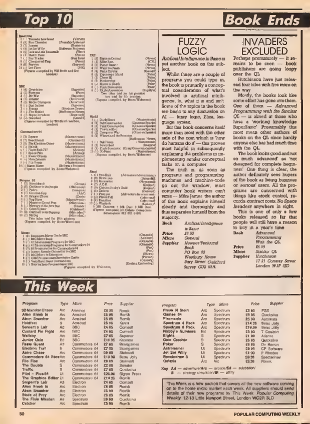
The system will enable you to develop files of names and addresses and print labels or letters, taking names and addresses from the file and printing them sequentially

The program comes with a brief manual explaining the main features of the program with notes on using it in conjunction with *Wordwise* It is not bargain at over thirty quid, though.

Program *Random Access Mailing*
Price *£36.86*
Micro *BBC*
Supplier *Micro Aid*
25 Fore Street
Praze Camborne
Cornwall
TR14 0JX

Compiled by Graham Taylor

New Releases is designed to let people know what software is coming on the market If you have a new game or utility which you are about to release send a copy and accompanying details to New Releases *Popular Computing Weekly* 12 13 Little Newport Street London WC2R 3LD



Top 10

Spectrum

1 ( )	Tornado Low level	(Vortex)
2 (8)	Blue Thunder	(Foundry Systems)
3 (7)	Zaxxon	(Starzone)
4 (2)	Jet Set Willy	(Software Projects)
5 (6)	Jack and the Beanstalk	(Thor)
6 ( )	Match Point	(Psion)
7 ( )	Star Trader	(Bug Byte)
8 ( )	Chequered Flag	(Psion)
9 (8)	Psytron	(Beyond)
10 (–)	Les Flics	(PSS)

(Figures compiled by WH Smith and Son London)

BBC

1 (6)	Overdrive	(Superior)
2 (2)	Fortress	(Pace)
3 ( )	Mr Wiz	(Superior)
4 (1)	Aviator	(Acornsoft)
5 (3)	Micro Olympics	(Acornsoft)
6 ( )	Star Striker	(Superior)
7 ( )	Frenzy	(Program Power)
8 ( )	The Hobbit	(Melbourne House)
9 ( )	Super Invaders	(Acornsoft)
10 (–)	Snowball	(Level 9)

(Figures compiled by WH Smith and Son, London)

Commodore 64

1 (3)	Squash	(Mastertronic)
2 (7)	Beachhead	(Centresoft)
3 (8)	The Election Game	(Mastertronic)
4 (1)	Hektik	(Mastertronic)
5 ( )	Flight Path 737	(Anirog)
6 ( )	Space Pilot	(Anirog)
7 ( )	Music Creator	(Mastertronic)
8 (–)	Munchmania	(Mastertronic)
9 (–)	Sub Hunt	(Mastertronic)
10 (–)	Manic Miner	(Software Projects)

(Figures compiled by Boots/Websters)

Dragon 32

1 (2)	Hunchback	(Ocean)
2 (9)	Cuthbert in the Jungle	(Microdeal)
3 ( )	Pedro	(Imagine)
4 (1)	Chuckie Egg	(A&F)
5 (8)	Dragon Chess	(Oasis)
6 ( )	Bug Diver	(Mastertronic)
7 ( )	Mansion Grand Prix	(Microdeal)
8 ( )	Mystery of the Java Star	(Shards)
9 ( )	Cave Fighter	(Cabletext)
10 (9)	Cuthbert goes Digging	(Microdeal)
10 (7)	Mr Dig	(Microdeal)

Two titles tied for 10th position.
(Figures compiled by Boots/Websters)

ZX81

1 (8)	Krypton Ordeal	(Novus)
2 (1)	Alien Rain	(CRL)
3 (3)	Planet Rescue	(Novus)
4 (6)	Walk the Plank	(Novus)
5 (4)	Plaza Crystal	(Carnell)
6 (9)	Espionage Island	(Psion)
7 (7)	Chess IK	(Psion)
8 (5)	Mothership	(Psion)
9 (–)	Mazes of Death	(Psion)
9 ( )	Flight Simulation	(Psion)
9 ( )	ZX Ace Assembler	(Bug Byte)

Two titles tied for 1st position and tied for 9th position.
(Figures compiled by Boots/Websters)

Vic 20

1 ( )	Dark Street	(Mastertronic)
2 (8)	Sub Commander	(Creative Sparks)
3 (6)	Tank Commander	(Creative Sparks)
4 (7)	Towns of Evil	(Creative Sparks)
5 (5)	Computer War	(Creative Sparks)
6 (4)	Wizard and the Princess	(Melbourne House)
7 ( )	Sub Hunt	(Mastertronic)
8 (3)	Bewitched	(Imagine)
9 (1)	Flight Simulator	(Crazy Communications)
10 ( )	3D Piano	(Mastertronic)

(Figures compiled by Boots/Websters)

Atari

1 (1)	The Hulk	(Adventure International)
2 (3)	Bruce Lee	(Datasoft)‡
3 (2)	Encounter	(Novagen)‡
4 (7)	A.C.E.	(English)
5 (9)	Captain Sticky's Gold	(English)
6 (6)	Zaxxon	(Datasoft)
7 ( )	Preppie	(Adventure International)
8 (5)	Planet Fall	(Infocom)†
9 (4)	Deadline	(Infocom)†
10 ( )	Warlock	(Calisto)^

‡ 3SR Cassette, † 5R Disc, ^ 8SR Disc.
(Figures compiled by Calisto Computers Birmingham 021 632 6458)

Books

1 (1)	Beginners Micro Guide BBC	(Granada)
2 ( )	BBC Micro Book	(Addison)
3 ( )	40 Educational Programs for BBC	(Granada)
4 ( )	40 Educational Programs for Commodore 64	(Granada)
5 (7)	60 Programs for the Commodore 64	(Pan)
6 ( )	Instant Arcade Games for the BBC	(Pan)
7 ( )	BBC Micro in Education	(Shiva)
8 ( )	CBM Programmers Reference Guide	(Pitman)
9 ( )	Very Basic Super Commodore	(Century)
10 ( )	Step by Step Programming BBC	(Dorling Kindersley)

(Figures compiled by Websters)

Book Ends

FUZZY LOGIC

Artificial Intelligence in Basic is yet another book on this subject.

Whilst there are a couple of programs you could type in, the book is primarily a conceptual consideration of what's involved in artifical intelligence, ie, what it is and isn't. Some of the topics in the book are basic to any discussion on AI — fuzzy logic, Eliza, language syntax.

But this book concerns itself more than most with the other side of the coin which is 'how do humans do it' — thus proves most helpful in subsequently explaining the problems in implementing similar conceptual tasks on a computer.

The truth is, as soon as programs and programming machines and machine-code go out the window, most computer book writers can't write — Mike James the author of this book explains himself clearly and thoroughly and thus separates himself from the majority.

Book	*Artificial Intelligence in Basic*
Price	*£6.95*
Micro	*General*
Supplier	*Newnes Technical Book, PO Box 63, Westbury House, Bury Street Guildford, Surrey GU2 5BH.*

INVADERS EXCLUDED

Perhaps prematurely — it remains to be seen — book publishers are going loopy over the QL.

Hutchinson have just released four titles with five more on the way.

Mostly, the books look like some effort has gone into them. One of them — *Advanced Programming with the Sinclair QL* — is aimed at those who have a 'working knowledge SuperBasic'. Presumably this most mean other authors of books on the QL since hardly anyone else has had much time with the QL.

The book looks good and not so much 'advanced' as 'not designed for complete beginners'. One thing is clear, the author definately sees buyers of the book as being business or serious' users. All the programs are concerned with things like stock control, records contract costs. No *Space Invaders* anywhere in sight.

This is one of only a few books released so far that people will still have a reason to buy in a year's time.

Book	*Advanced Programming With the QL*
Price	*£5.95*
Micro	*Sinclair QL*
Supplier	*Hutchinson, 17 21 Conway Street, London W1P 6JD*

This Week

Program	Type	Micro	Price	Supplier
3D Monster Chase	Arc	Amstrad	£8.95	Romik
Alien Break In	Arc	Amstrad	£8.95	Romik
Atom Smasher	Arc	Amstrad	£5.99	Romik
Holdfast	S	Amstrad	£6.95	Kuma
Serpent's Lair	Ad	BBC	£4.95	Comsoft
Custard Pie Fight	Arc	BBC	£4.95	Comsoft
Wallaby	Arc	BBC	£7.95	Superior
Junior Quiz	Ed	BBC	£10.95	Kosmos
Fasse Quest	Ad	Commodore 64	£7.95	Braingames
Electron Trail	S	Commodore 64	£7.95	Braingames
Astro Chase	Arc	Commodore 64	£9.95	Statesoft
Commodore 64 Race	Arc	Commodore 64	£19.99	Beau Jolly
File Fise	Arc	Commodore 64	£8.95	Statesoft
The Double	S	Commodore 64	£2.95	Senator
Traffic	S	Commodore 64	£7.95	Quicksilva
Pilot – Plus 64	Ut	Commodore 64	£26.00	Sigma Press
The Graphics Editor	Ut	Commodore 64	£14.95	Romik
Serpent's Lair	Ad	Electron	£4.95	Comsoft
Alien Break In	Arc	Electron	£8.95	Romik
Atom Smasher	Arc	Electron	£5.99	Romik
Birds of Prey	Arc	Electron	£8.95	Romik
The Final Mission	Ad	Spectrum	£9.50	Quicksilva
Catcher	Arc	Spectrum	£5.95	Romik
Frank N Stein	Arc	Spectrum	£5.95	PSS
Games 64	Arc	Spectrum	£9.95	Quicksilva
Piromania	Arc	Spectrum	£6.00	Automata
Spectrum 4 Pack	Arc	Spectrum	£14.95	Beau Jolly
Spectrum 6 Pack	Arc	Spectrum	£19.99	Beau Jolly
Nobby's Numbers	Ed	Spectrum	£5.00	T Cousen
Eights	S	Spectrum	£1.99	Atlantis
Gate Crasher	S	Spectrum	£6.95	Quicksilva
Poker	S	Spectrum	£8.95	De Barron
Astronomer	Ut	Spectrum	£9.95	CP Software
Jet Set Willy	Ut	Spectrum	£1.00	P Rhodes
Spectadraw 3	Ut	Spectrum	£9.95	Spectadraw
Galaxia	Arc	Vic	£5.99	Romik

Key Ad — adventure/Arc — arcade/Ed — education/ S — strategy simulation/Ut — utility

This Week is a new section that covers all the new software coming on to the home micro market each week. All suppliers should send details of their new programs to This Week *Popular Computing Weekly* 12-13 Little Newport Street, London WC2R 3LD

Ziggurat



Freeware

Copying is not just endemic in computing but in all aspects of life. And many people, and the organisations which employ them, are only too willing to live off the ideas of others.

It is wrong to copy software without the author's permission. But what about many of the games available which in turn are developed from the ideas of others — the *Frogger*, *Q-Bert* and *Pac-Man* rip-offs?

I believe that just as it is wrong to pirate software it is *morally* wrong to explicitly copy the *ideas* of others. It is only human to be influenced but there is a clear difference between explicit copying and just being influenced.

Similar questions of morality come into play in a new concept in software from the USA called 'freeware'. Freeware provides an intreguing alternative approach to the distribution of software.

At one time, in the early days of computing it was quite easy to write software as part-time occupation, advertise in magazines, and sell the software by post. Unfortunately the purchaser of such software — buying blind — was often taken for a ride.

As a response to the uncertainties of software by post, people began to purchase from shops, from producers whose names they knew. Now, the influence of the small software house has further diminished under the impact of the Megagames hype, with the puchaser quite often being taken for a ride on price (and thus, one reason for the extensive copying of games).

Freeware tries to break that vicious circle of fewer software houses selling more expensive software, which encourages more copying, which ultimately ends up with fewer software houses producing even more expensive software.

With freeware you do not charge for your software, and you even encourage its copying. All you ask is that, *if the user is satisfied with your product*, s/he sends a fee — or donation — entitling them to software updates, manuals, and the like.

Freeware depends on a primitive morality in that if you are satisfied with a product you will feel inclined to assist the producer, and encourage the production of further good programs. The principal market for freeware in the USA is for the IBM PC, and many software writers are now distributing freeware.

Those who are producing good freeware are making a living, in a comfortable second income (the most famous is *PC Talk*). The initial outlay is negligible, distributiontakes care of itself — people just copy — and the little person again has an advantage over the large organisation. And for the user freeware offers the advantage that it gets round the problem of buying blind.

The single most important characteristic of Freeware software is that if it has to be success, then it must offer outstanding value — in terms of its programming, and what the program can do.

Otherwise no-one would feel inclined to send any donations to the freeware house.

Think of all the copied programs in your possession. How many programs are sufficiently good that you feel you want to donate money to its producer? Probably not many.

Which proves, at least that the present system of software purchasing isn't perfect. And that it is worth thinking about alternatives.

Boris Allan

Puzzle

Broken up

Puzzle No 120

For Alphonse at the 'Ristorante Francaise' it had been a disaster.

First of all came his bill for the rates, and as if this wasn't enough, the gas oven promptly exploded whilst the speciality of the house was in preparation. Thus, the *Moules marinade a la Flambé* ended up with considerably more *flambé* than *moules*.

The result of this configuration was the arrival of a gentleman from the gas board, and a number of broken windows caused as a consequence of the rapid departure of a number of *moules*.

Alphonse went to the till.

The rates bill cost him just half of what he had plus half a pound.

The gas repair cost just a third of the remainder plus one third of a pound.

The glazier's bill amounted to one quarter of what now remained plus one quarter of a pound.

The painter charged one fifth of what he had left plus one fifth of a pound.

Yet, curiously, each bill amounted to an exact number of pounds and, as for poor Alphonse, to add insult to injury the number of pounds that he had left at the end of the day was an exact multiple of 13!

Can you say what the days mishaps had cost?

Solution to Puzzle No 115

The problem depends on finding the prime factors of 16000001. For the solution to the unambiguous there would need to be just three prime factors.

10 Let L = 16000001 **20** FOR N = 3 TO SQR(L) STEP 2 **30** LET Z = L/N **40** IF Z = INT(Z) THEN GOTO 100 **50** NEXT N **60** STOP **100** PRINT N **110** LET L = Z **120** GOTO 50

This program reveals the three factors to be 109, 229 and 641. From the information given we can find that therer were 229 copies of *Hacker* produced each week, over a 109-week period, each copy costing £8.41.

Winner of Puzzle No 115

The winner is: Paul Clarke, Brent Moor Road, Bramhall, Stockport, Cheshire, who receives £10.

Rules

The closing date for entries to Puzzle No 120 is September 1.

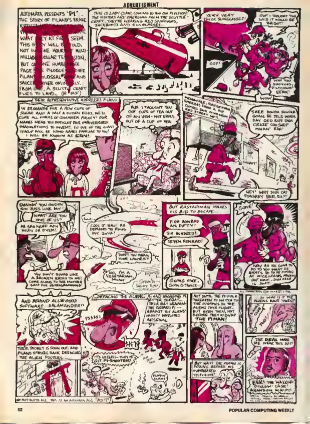
The Hackers

Anyone fancy a spot of overtime?

Right – just convert our integrated accounting-word-processing-database-spreadsheet package for the new Prune micro.

Oh by the way, the Prune only has 8k of ram.

?!?!



AUTOMATA PRESENTS 'PI'. THE STORY OF PILAND'S BRAVE
WHAT EY AT FI SEEM. THIS S Y WILL B TOLD, NOT IN INE HOUR F MULTI-MILLIO DOLLAR TE SION, BUT ONE HUMB PAGE E PILOGUE OVER PILAN OLOSSAL* AND SAUCE OVER OMI LY. FROM ONE, A SCUTTLE CRAFT FLIES TO LAND. (* 'BIG')
THIS IS LADY CLAIR, COMING TO YOU ON PIVISION! THE VISITORS ARE EMERGING FROM THE SCUTTLE-CRAFT. THEY'RE WEARING RED UNIFORMS, JACKBOOTS AND SUNGLASSES
VERY VERY THICK SUNGLASSES!
OW! I THOUGHT YOU SAID IT WOULD BE BRIGHT!
OOP!
WHO YOU SHOVING, PILTDOWN JERK!
WOW!
THEIR REPRESENTATIVE ADDRESSES PILAND
IN EXCHANGE FOR A FEW CUPS OF SUGAR AND A HALF A DOZEN EGGS, WE'LL CURE ALL FORMS OF COMPUTER PIRACY! OUR NAMES WERE TOO DIFFICULT FOR IMPOVERISHED IMAGINATIONS TO INVENT, SO WE OF THE GIANT TEACUP WILL BE USING NAMES FAMILIAR TO YOU! I WILL BE KNOWN AS ERN!
HUH I THOUGHT YOU GOT CUPS OF TEA OUT OF AN URN - NOT ERNS OUT OF A CUP OF TEA
MEANWHILE, RASTAPIMAN EMERGES FROM A HIP CLOTHES BAR IN HIS NEW RED STREET SUIT
SHEE DOUGH SHUCKA GOAN BE JELS WHEN DAY GED RIFF DISH CRAZE COO SHEP MWAN! RAH!
SHNAPT!
HEY! WHY DISH CAT POSHDY BEELSH?!
EAMONN! YOU GODDY SOO JUSS LIKE MY!
WHAT! ARE YOU ONE OF US?
AH SHO NUFF AIN WUN OH DYEM!
YOU DON'T SOUND LIKE A BROKEN RADIO TO ME! COME ALONG TO THE MOTHER SHIP FOR DEPROGRAMMING!
COOL IT BRO! AH DEMAND TO RING MY SOYA!
DON'T YOU MEAN YOUR LAWYER?
NO, I'M A VEGETARIAN, MWAN!
Gremlin Square Eyes Evans
BUT RASTAPIMAN MAKES HIS BID TO ESCAPE
FIGH HONRAD AN FIFTY!
SIX HUNDRED!
SEVEN HONRAD!
GOING ONCE. GOING TWICE
GONE!
NOW AH ISH GONE TO DO TO YOU WHAT DE BRATS DO TO DE PIMAN AT MICROFAIRS, MWAN BUT WAIT - DISH FACE IS SOFT
AND BEHIND ALL* GOOD SOFTWARE SALAMANDER!!
PSSSSS
HEY!
...DEFACING THE ALIENS...
THEIR SECRET IS SOON OUT AND PILAND STRIKES BACK, DEFACING THE ALIEN POSTERS ...
...AND ENGAGING IN BITTER COMBAT... THEIR ONLY WEAPON - THE CUSTARD PI - AGAINST THE ALIENS' HIGHLY DEVELOPED ARSENAL
IT'S USELESS - THEY'VE GOT PI-SHOOTERS!
FLIPPIN' ALIENS!
* NOT QUITE ALL THIS IS AN AUTOMATA AD! AD?!?
NOT UNTIL THE PI-FOLK THREATEN TO SWITCH TO THE OLYMPICS DO THE ALIENS TAKE FLIGHT - BUT EVEN THEN, NOT BEFORE THEY KIDNAP THE PIMAN!
BUT WAIT! THE PIMAN IS DOZING BEFORE HIS OVERHEATED TELEVISION!
SO WHO IS IT THE ALIENS HAVE TAKEN?
THE DEVIL MADE ME WEAR THIS SUIT!
EEK! THE WALKING PILLOW-CASE! ABANDON SCRIPT!